
675 Wildwood Avenue
Rio Dell, Ca 95562
(707) 764-3532



**CITY OF RIO DELL
STAFF REPORT
CITY COUNCIL AGENDA**

TO: Mayor and Members of the City Council
THROUGH: Ron Henrickson, City Manager
FROM: Karen Dunham, City Clerk
DATE: May 1, 2012
SUBJECT: Portable Pipeline Inspection Camera System

RECOMMENDATION

Receive and file bids for the Portable Pipeline Inspection Camera System

BUDGETARY IMPACT

BACKGROUND AND DISCUSSION

The bid opening for the Portable Pipeline Inspection Camera System was held on April 25, 2012. Three (3) bids were received as follows:

1) WECO Industries	-	\$53,196.00
2) RS Tech	-	\$57,442.07
3) MME (Municipal Maintenance Equipment)	-	\$67,575.00

Staff will be coming back to the Council at the May 15, 2012 regular meeting with a recommendation and request for authorization for purchase of the equipment.



Quote No. 42512

630 Eubanks Court Suite K
Vacaville, CA 95688

(800) 677-6661 Fax: (707) 446-7933

QUOTATION

Customer
Contact CITY MANAGER
Company CITY OF RIO DELL
Address 675 HILLTOP AVE

City RIO DELL State CA Zip 95562
Cell Fax

Date 4/25/2012
Expiration 7/25/2012
Salesman LEIGHTON WHITE
Terms N-30
Delivery DESTINATION
FOB DESTINATION

Item	Qty	U/M	Part No.	Description	Unit Price	TOTAL
				WECO INDUSTRIES IS PLEASE TO QUOTE IN RESPONSE TO YOUR RFP DUE 4-25-12 BY 4:00 pm		
1	1	EA		PORTABLE MAINLINE SYSTEM K2-DOLLY AS PER ATTACHED SPECIFICATION	\$49,600.00	
				SUB-TOTAL	\$49,600.00	
				CA STATE SALES TAX @ 7.25%	\$3,596.00	
				FREIGHT	\$0.00	
				GRAND TOTAL DELIVERED	\$53,196.00	
				COMPONENT BREAKDOWN PRICING FOR THIS RFP ONLY		
1	1	EA		CAMERA, SONDE, SPARE PARTS	\$11,236.00	
2	1	EA		TRANSPORTER, LIFT, TIRES	\$11,462.50	
3	1	EA		PCU, CONTROLLERS	\$8,183.00	
4	1	EA		REEL WITH CABLE	\$7,676.83	
5	1	EA		LAPTOP WITH SOFTWARE	\$9,496.75	
6	1	EA		MANHOLE ACCESSORIES	\$500.41	
7	1	EA		TRAINING ON SITE 3 DAYS	\$1,044.51	
				SUB-TOTAL	\$49,600.00	
				CA STATE SALES TAX @ 7.25%	\$3,596.00	
				FREIGHT	\$0.00	
				GRAND TOTAL DELIVERED	\$53,196.00	

Weco

Offering Complete Solutions

For Our Municipal and Contractor Customers

Visit our web site- <http://www.wecoind.com>

Subtotal	
Shipping & Handling	
Taxes	
Other	
TOTAL	

City of Rio Dell Technical Proposal –Portable Camera System

Introduction

This proposal is submitted to the City of Rio Dell in response to the RFP for the Portable Mainline Rotating Head Sewer Television Camera System. Proposal submitted by:

Dealer: WECO Industries
Contact: Tom Johnson
630 Eubanks Court
Suite K
Vacaville, CA 95688
Phone: 707-446-6661
Fax: 707-446-7933
E-Mail: tjwecoind@sbcglobal.net

Summary of System:

WECO/CUES is submitting this proposal as a qualified firm to provide a complete fully operational K2 color portable TV Inspection System that will be outfitted to inspect and document sewers ranging from 6" – 24". **The system features an integrated, portable, hand held wireless controller that controls all camera, transporter, and reel functions. It can be operated from up to 50 ft. line of site from the unit, or from the front or rear if the unit is mounted in a vehicle or trailer.** The unit is provided with a compact steerable wheeled camera transporter with multiple sets of tires / wheels to accommodate varying pipe conditions. An optical zoom pan and tilt camera will be equipped with a 40:1 optical / digital zoom ratio, built in camera diagnostics, and 4-step light enhancement for difficult light conditions. **The camera connects directly to the transporter, eliminating external interface cables. The camera also includes a built in Sonde/transponder designed to emit continuous magnetic pulses for locating.** The video cable reel is provided with 1000 ft. high strength / lightweight multi conductor video cable. The system will be provided with Granite XP software which is NASSCO V6.0 compliant and loaded on a Dell Latitude E6520 laptop computer.

Plan and Method of Approach to Accomplish the Scope of Work

WECO/CUES proposes to furnish a new K2 portable Color TV Inspection System for the City of Rio Dell with all necessary equipment to perform TV Inspections of sewers from 6" – 24" pipe. Detailed descriptions and benefits of the equipment provided by WECO/CUES are listed below. This equipment will be manufactured at CUES manufacturing facility. This facility is located at:

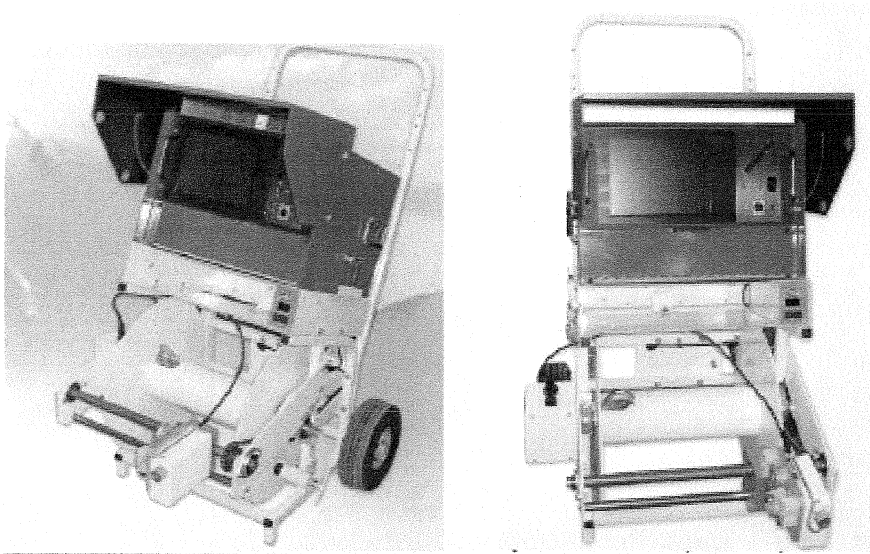
Manufacturing Location:

CUES
3600 Rio Vista Avenue
Orlando, FL 32805

The equipment provided by CUES shall be labeled and listed as a minimum by

a Nationally Recognized Testing Laboratory (NRTL) to the applicable Standard for Safety for Closed Circuit Television Equipment, UL 2044, 2nd edition, 11/9/01. A listing report can be supplied that certifies the equipment is acceptable as defined by 29 CFR 1910.399 and required by 29 CFR 1910.303(a). NRTL labeled and listed equipment shall be supplied as required by the FEDOSHA memorandum, dated September 25, 2005, page 3, Section on Compliance, prepared by John L Henshaw, Assistant Secretary of Occupational Safety and Health.

A. K-2 Power / Control Unit portable set up



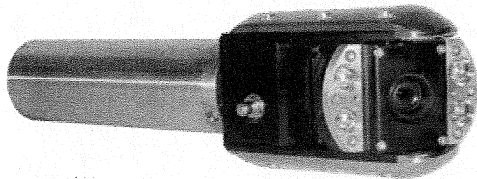
- Chain driven and properly reinforced to withstand 200% of the maximum motor torque to insure trouble free operation
- Automatic levelwind assembly to evenly payout or rewind the cable to prevent pile-ups, entanglements and burying
- Minimum storage capacity for 1000 ft. high strength multi conductor video cable (2,000 lbs. break strength)
- Cable shall be equipped with a waterproof field replaceable metal splice chamber (no scotch cast).



A portable wired and wireless hand held controller is provided for the operator. The operator shall have control of all transporter, camera, and reel functions from up to 50' away from the unit with the wireless controller

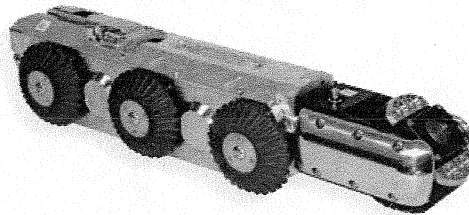
OZ III Optical Zoom Pan and Tilt Camera:

- Provides 40:1 optical / digital zoom ration with built in LED lighting for 6" through 42" lines. Optical Zoom is 10:1
- The camera is provided with built in self- diagnostics to include temperature, humidity, camera and light voltage, serial number, and hour meter to facilitate maintenance and trouble- shooting.
- The camera is provided with a 4-step light enhancement feature for challenging light conditions. Each step increases the light sensitivity of the camera by a multiple of 4 times.
- The camera has a built in Sonde designed to emit continuous magnetic pulses/signals
- The camera head has a built in protective fork system to shield the camera from shock and impact during retrieval and insertion.
- Wireless Handheld controller for all camera, reel and transporter functions.
- The camera shall connect directly into the transporters built in receptacle located in the transporter assembly.

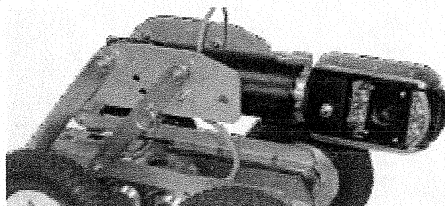


Compact Wheeled Steerable Transporter for 6"-24" pipe

- **Full steering** – avoids almost all potential of the unit tipping over. It can be steered from the sides of the pipe if it begins to ride on the side of the pipe. It can be steered to access difficult easements and can negotiate all 22, 45, and 90degree sweeps in the larger diameter pipes.
- **One hand control** Wireless control is provided for the operator. The operator will have full mobility when operating the controller. The unit controls all transporter and optical zoom pan and tilt camera functions, including an option for a remote electronic camera lift via one hand. It is operated from the front, rear, or within line of sight of the unit.
- Four Wheel Sets shall be provided.
- Can pull up to 1000 ft. multi conductor cable.
- Runs in forward, powered reverse, and freewheel plus full proportional steering.
- Can inspect offset 6" diameter and 6" relined pipe with full pan and tilt abilities
- The OZ III Pan and tilt zoom camera plugs directly into the compact wheeled steerable transporter with no external interconnect cables.
- **A rear tip up waterproof universal 12 pin connector** is provided on the rear of the transporter to minimize stress and strain on the cable connection during insertion and retrieval.
- **Built in Two-Speed Transmission**-doubles the torque of the drive train when the large diameter tires are installed (7.9" diameter tires)



Pneumatic tires and manual camera lift for larger pipe shall be provided:



Granite XP Data Acquisition Software:

a. General Overview

- Granite XP (Granite) is a comprehensive data collection and pipeline inspection management software offering **flexibility, customization, and ease-of-use** to meet the growing needs of municipalities as well as requirements for CMOM and GASB 34.
- Granite XP has been certified for PACP use by NASSCO V6.0 Standards
- There is no third party software supplied. All software and interfaces are written and supplied by CUES, creating the need for only one phone call to facilitate troubleshooting by the city of Newport News. CUES technicians are strongly educated on the relationship between the CCTV equipment, the video overlay, the software, and the footage meter, as they are all designed and built by CUES engineers.
- Granite XP has a bi-directional interface with ESRI ArcGis 9.1. CUES is a registered business partner of ESRI and has completed all schooling requirements to attain this status.
- Granite XP is designed with an **asset-based architecture**, so you can navigate to a particular asset (e.g., pipe segment or manhole) and view all the inspections related to that asset as suggested by GASB 34 and CMOM. This asset-based architecture was written to facilitate data transfer between asset-based Asset Management packages like Azteca Cityworks, Hansen, and Maximo, and GIS systems such as ESRI ArcGIS.
- For users who prefer to create individual Projects and perform data collection in the traditional way, Granite XP makes the process faster and easier

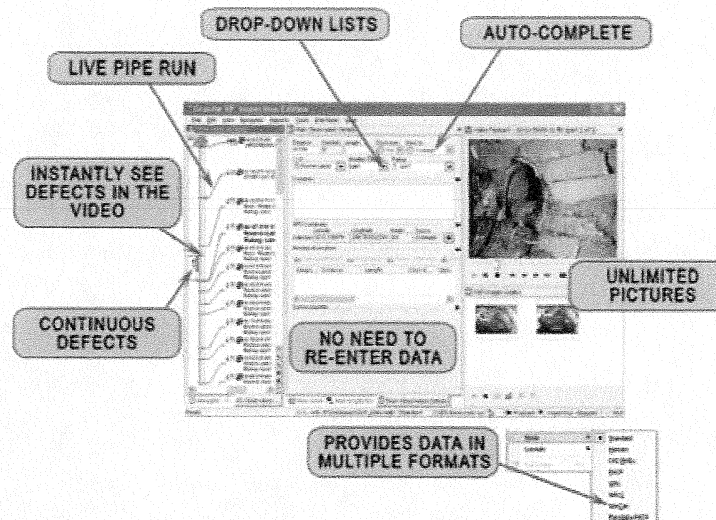
b. Ease of Use

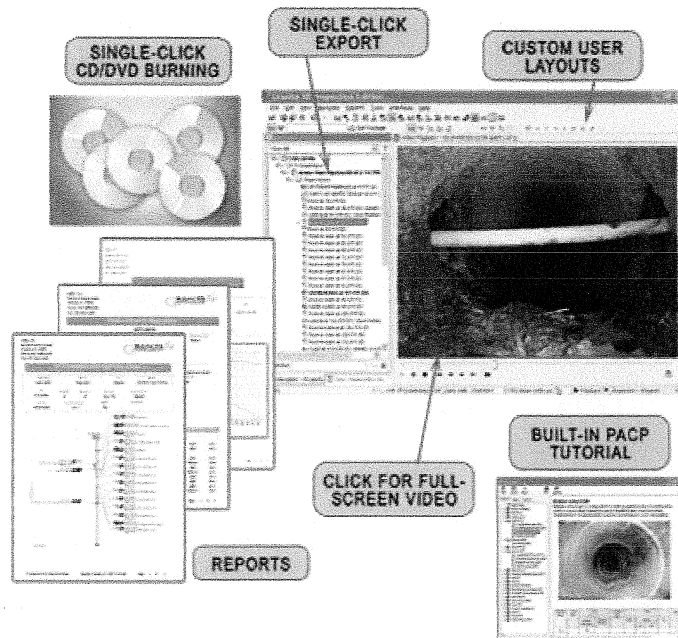
- CD/DVD burning can be done with one mouse click.
- Granite XP's wizard can burn directly to CD/DVD, even in the truck
- Inspections can be selected from the Project Navigator and burned to CD/DVD with a single click
- Reports can be created with one mouse click and have your logo in them
- The user can perform "multi selection" to select, for example, a complete database, a specific project, a particular asset, or many other options. A copy of the GXP Viewer can also be included for client review.
- Drop-down menus and 'auto-complete' feature offer quick and accurate selection
- Help Files are available in the program anytime to assist the user
- Intuitive Microsoft layouts are familiar to almost everyone
- Granite XP allows for reverse setup's in a single inspection
- Flexible Architecture
- Plug-ins allow software developers to provide significant customization and the addition of future modules (extensible)
- Third-party software, custom-designed modules, and infrastructure asset management systems can be integrated without rebuilding the program

- Flexibility to customize your personal views of information depending on the type of work you do; layouts can be easily customized or you can select one of the default layouts for quick operation
- Label Manager provides a quick method to customize the fields and labels to work in your specific environment
- The Code Editor includes several standard code systems including PACP, WRc, Sewer.Dat. and supports User-defined code systems. You do not need to load new software to switch code systems. It is easily changed within the Granite XP program.

c. Features and benefits of Granite XP Software:

- Granite XP is designed with an asset-based architecture as opposed to the inspection based design that is used by many systems. In an asset-based system, information is stored in permanent tables, similar to the Azteca Cityworks, Hansen and ESRI ArcGIS software systems. Bi-directional (two-way) interfaces are available within Granite XP to accomplish seamless data integration between Granite XP and Azteca Cityworks and Granite XP and ESRI ArcGIS 9.0 version or later software.
- Inspection or project- based systems can only retain information that has been collected in an inspection. These systems cannot populate the database before inspections are generated. In inspection- based systems, the data is held in individual records where asset information is duplicated for each inspection. This increases the possibility of data corruption with each inspection.





d. Unique Features of Granite XP Software

- Our focus is on the user application and ease of use for acquiring information and digital video that can be quickly distributed within your organization to facilitate the decision making process.
- Observations and defects noted can be designated as spot or continuous. For example, a longitudinal crack can be designated as starting at 6ft. and ending at 9ft. Additional observations can be nested within the same footage span, either and designated as spot or continuous.
- Random Access of Video – the user points and clicks on an observation, and the corresponding video appears, thus eliminating time consuming searches for specific video.
- One Click CD / DVD burning.
- Multiple and editable code systems that can be customized to fit your needs.
- Unlimited number of snap shots per observation.
- **Can support, synchronize, and run on multiple enterprise databases such as Oracle, SQL Server, and Access.**
- Customizable screen layouts and field label manager to fit your individual requirements.
- Real time on screen Pipe Graphs with defects, observations, and lateral locations noted with corresponding footage.
- Real time on screen Pipe Graphs with pipeline gradient graphs.
- Built-in synchronization and replication to allow for the smooth merging of data to and from the field, to the office, and to interested parties such as engineering firms.

TV Crew Training:

CUES will provide three days training for TV crews for the Portable TV Inspection System.

Warranty

CUES one year warranty applies to all systems manufactured and supplied by CUES.

CUES Experience with Similar Projects

CUES has been in business for 48 years and is the largest manufacturer of this type equipment in the country. Established in 1964, Cues continues to be the industry leader in designing and manufacturing closed circuit television systems and software based data acquisition / decision support systems for the inspection and condition assessment of wastewater collection and sewer line systems. CUES currently supports over 10,000 active systems in the United States. More municipalities and private contractors throughout the world use CUES systems than all other manufactured brands combined.

CUES produces over 300 truck mounted and portable TV Inspection Systems per year.

TV Equipment Service Centers and Information: Parts and Service are available from 7:00 AM EST to 5:00 PM PST via the following facilities:

Local Dealership for Service and Parts:

WECO Industries
Contact: Tom Johnson
630 Eubanks Court
Suite K
Vacaville, CA 95688
Phone: 707-446-6661
Fax: 707-446-7933
E-Mail: tjwecoind@sbcglobal.net

CUES also has an additional service location in CA which is listed below :

CUES WEST -Ontario, CA

1943 S. Augusta Ct.
Ontario, CA 91761
800-544-8695

Each of these facilities provides repair service, loaner equipment and replacement parts.

In Addition, Granite XP has its own support site and troubleshooting service.

www.granitexp.com

Loaners:

Loaners are available at no charge for the life time of your equipment in the event of service needs. Shipping fees will apply. Loaners are stocked on both coasts and at WECO. Loaners can also be requested for troubleshooting purposes.

Replacement parts will typically be available for approximately 10 to 20 years.

Delivery:

Equipment will be delivered 30-45 days after receipt of purchase order.

Specifications For: Rio Dell, CA

K2 PORTABLE TV INSPECTION SYSTEM

1 P&T ZOOM III M/C BUILT-IN SONDE LED CAMERA

- 1 Solid State Color Sewer TV Camera
- 1 Pan & Rotate Camera Head, 40:1 Zoom Ratio, 10x Optical Zoom, 4x Digital Zoom
- 1 NTSC Color Standard with 4x Light Integration
- 1 Camera Lighting System with Integrated White LED Light Modules for 6" Relined thru 48" Pipe
- 1 Built In Transmitter, 512 Hz
- 1 Camera Transportation and Storage Case

1 CAMERA SPARE PARTS KIT

1 ALUMINUM COMPACT STEERABLE CAMERA TRANSPORTER, WHEELED

- 1 Steerable Unit Designed to Turn 360 Degrees Within Its Own Radius
- 1 Two (2) Speed Transmission to Maximize Torque in Large Diameter Pipe with:
 - 1 Manual Shifter on Camera Carrier
- 1 Unit Shall Have Forward, Free Wheel, and Power Reverse
- 1 Set of Driven Rubber Wheels to Inspect 6" Pipe
- 1 All Six (6) Wheel Drive Transporter Assembly to Include:
 - 1 Motor & Enclosed Drive Train
- 1 Tip Up Rear 12-Pin Connector

1 8" RUBBER WHEEL KIT FOR COMPACT TRANSPORTER

1 10-15" RUBBER WHEEL KIT FOR COMPACT TRANSPORTER

1 MANUAL LIFT FOR COMPACT LITE WHEELED TRANSPORTER

1 KIT,TIRE,PNEUMATIC,12"+ PIPE, COMPACT TRANSPORTER

1 SHIPPING CASE FOR CPR TRANSPORTER

1 PCU ASSEMBLY, NTSC

Combination Color Camera Control System / Monitor (110 VAC or 220 VAC, 50 Hz or 60 Hz, NTSC or PAL)

- 1 Mounted in Transportation Cabinet
- 1 10" Flat Screen Monitor & Set of Connecting Jacks for Video In and Video Out
- 1 Integral Data Display System to Include:
 - 1 Alpha Numeric Information Display & Multi Paging and Defect Coding
 - 1 Remote "QWERTY" Keyboard for Dat Entry with WRC and PACP Codes

1 WIRED USB CONTROLLER

- 1 Joystick Control for Pan and Tilt Zoom Camera to Include:
 - 1 360 Degree Rotate
 - 1 330 Degree Optical Pan
- 1 Joystick Control for All Steering Functions & Forward / Reverse Directions for Transporter
- 1 Camera Lift Control for Optional Electronic Camera Lift
- 1 All Other Controls for Camera to Include:
 - 1 Camera Iris and Focus Override & Zoom
 - 1 Camera Lights & Shutter Control for Light Enhancement
 - 1 Camera Diagnostics & Auto Home
- 1 Cruise Control to Set Speed of the Transporter for Hands Off Operation
- 1 All Reel Controls to Include: Retrieve, Release, and Variable Speed [Excluding Dolly Systems]

1 WIRELESS CONTROLLER

- 1 Joystick Control for Pan and Tilt Zoom Camera to Include:
 - 1 360 Degree Rotate
 - 1 330 Degree Optical Pan
- 1 Joystick Control for All Steering Functions & Forward / Reverse Directions for Transporter
- 1 Camera Lift Control for Optional Electronic Camera Lift
- 1 All Other Controls for Camera to Include:
 - 1 Camera Iris and Focus Override & Zoom
 - 1 Camera Lights & Shutter Control for Light Enhancement
 - 1 Camera Diagnostics & Auto Home
- 1 Cruise Control to Set Speed of the Transporter for Hands Off Operation
- 1 All Reel Controls to Include: Retrieve, Release, and Variable Speed [Excluding Dolly Systems]

1 1000' PLATINUM CABLE ASSEMBLY, M/C 12PIN

- 1 1000' Platinum Multi Conductor Kevlar Fiber Armored Combination TV Transmission / Tow Cable
- 1 .350 Diameter
- 1 Metal Splice Chamber with Pigtail
- 1 Cable Strain Relief

1 CABLE, TEST, PORTABLE 2

1 WHEELED DOLLY, 110V TO INCLUDE:

- 1 Electric Motor Rewind
- 1 Hand Crank
- 1 Automatic Levelwind
- 1 Electronic Footage Meter

2 FASTENER PIN FOR DOLLY TRUCK MOUNT

1 SUPPORT FOR DOLLY, TRUCK MOUNT

1 CABLE 4'-CONTROL UNIT TO DOLLY

1 DVR / SD ASSEMBLY KIT WITH HARDWARE

1 PCU ENCLOSURE FOR DOLLY TO INCLUDE

- 1 Gooseneck Microphone
- 1 Mini Keyboard
- 1 Power Cable

1 DELL LATITUDE E6520 LAPTOP PIPELINE DATA COLLECTION & REAL TIME VIDEO CAPTURE

- 1 CPU: Intel Core i5-2430M processor (2.4GHz, 3M cache with turbo boost)
- 1 Memory: 4.0GB DDR3- 1333 MHz-SDRAM, 2 Dimms
- 1 128 Mobility SSD
- 1 Optical Device – 8X DVD+/-RW DVD
- 1 nVidia NVS 4200 M 512 MB DDR3 Discrete Graphics for Dual Core
- 1 Display: 15.6 LED
- 1 Sound: On Board Audio with Built In Stereo Speakers
- 1 WiFi: Integrated 802.11 b/g/n half mini card
- 1 OS: Windows 7 Professional 64
- 1 3 Year Accidental Damage Service

- 1 Bluetooth
- 1 Granite XP Inspection Edition Version 4.x Software
- 1 User Guide - Hard Copy
- 1 User Guide - CD
- 1 System Recovery Disk

1 PACP MODULE SOFTWARE

1 TIGER TAIL

1 MANHOLE TOPROLLER ASSEMBLY, TV ONLY

3 RETRIEVAL/DOWNHOLE POLE ASSEMBLY

1 RETRIEVAL HOOK

1 TRAINING, ON-SITE (THREE DAYS)

1 SHIPPING AND HANDLING

PAN, TILT, and OPTICAL ZOOM CAMERA

The unit shall be labeled and listed as a minimum by a Nationally Recognized Testing Laboratory (NRTL) to the applicable Standard for Safety for Closed Circuit Television Equipment, UL 2044, 2nd edition, 11/9/01. A listing report must be supplied that certifies the aforementioned equipment is acceptable as defined by 29 CFR 1910.399 and required by 29 CFR 1910.303(a). Self-certification or certification by a laboratory that is not an NRTL will be deemed unacceptable. NRTL labeled and listed equipment shall be supplied as required by the FEDOSHA memorandum, dated September 25, 2002, page 3, Section on Compliance, prepared by John L Henshaw, Assistant Secretary of Occupational Safety and Health.

The Pan, Tilt, and Zoom Camera shall be designed for use in 6" diameter relined pipe and larger. The unit will be designed to provide close-up views of pipe walls during inspection including minute defects and voids. The unit will be color, shall operate optimally through a maximum of 1200' multi conductor and shall consist of the following (minimum):

Camera

- Chassis construction shall include 100% solid state circuitry designed to withstand shocks and vibration normally sustained while being pulled through a pipe.
- The camera module shall be an industrial model only.
- REPACKAGED CONSUMER GRADE CAMERAS (I.E. CAMCORDERS) WILL BE DEEMED UNACCEPTABLE FOR USE IN A PIPELINE TELEVISION INSPECTION SYSTEM.
- Operating temperature ranges of the camera shall be 0 degrees C to 50 degrees C.
- CAMERAS INCORPORATING BUILT IN LIGHTING SYSTEMS THAT GENERATE HEAT EXCEEDING THE OPERATING TEMPERATURE PARAMETERS LISTED BY THE BASE STOCK CAMERA MANUFACTURER WILL NOT BE ACCEPTABLE.
- The camera shall develop a true color and transmit a sharp image picture on the video bandwidths only.
- PICTURE TRANSMISSION SYSTEMS THAT REQUIRE THE USE OF R.F. SUPPRESSORS AND ARE SUBJECT TO LOCAL TRANSMITTER INTERFERENCE SHALL NOT QUALIFY AS BEING EQUAL.
- Full color video bandwidths shall be provided with no sacrifice of low frequency response.
- There shall be no visible streaking of the low frequency test bars when viewing a standard EIA Test Chart.
- Shall not exceed an overall length of 14.5", a head length of 5.9", and a camera barrel diameter of 2.5".

Camera Optical & Digital Zoom

- Optical & digital zoom and zoom & focus speeds shall be selectable from the maintenance terminal.
- Remote control of pan, tilt, pan and tilt homing, optical zoom, manual focus, automatic focus, shutter speed, frame integration, manual iris, diagnostics and internal lights shall be provided.
- Optical Zoom Range: 10x
- Digital Zoom Range: 4x (40x with optical zoom)
- Total effective zoom ratio: 40:1
- The lens shall be an automatic iris type with a manual override (controlled from the control console) to control the illumination range for an acceptable picture between 3 and 10,000 lux.

Pan and Rotate Speeds

- Full Pan (no load): 56 deg/sec, full pan in 7-8 seconds
- Full Rotation (no load): 31 deg/sec, full rotation in 10-11 seconds

Camera Housing

- The camera mechanics and electronics shall be housed in a high strength, damage resistant, aluminum housing with a stainless steel tube.
- The rear portion of the camera shall not exceed 2.5 inches in diameter to allow for operation in skids and self-propelled units that are designed for 2.5-inch diameter cameras.

- The front of the camera head housing shall have a view port of optical grade sapphire.

- The camera connector shall integrate directly to the transporter, securing with a cam-locking action for positive sealing and retention.

Mounting Fork

- The forward portion of the camera shall not exceed 4 inches in diameter and will include the mounting fork, camera head and lighting.

- The camera forks must be rounded or chamfered and be the same diameter as the forward portion of the camera to eliminate any sharp corners that can become caught on obstructions.

- CAMERA FORKS THAT EXCEED THE DIAMETER OF THE CAMERA HOUSING THAT ARE SUBJECT TO DAMAGE INSIDE THE PIPE ARE NOT ACCEPTABLE.

- The mounting fork will rotate 360 degrees with an optical viewing angle of 400 degrees and shall allow the camera head to pan mechanically 285 degrees with a pan viewing angle of 331 degrees.

Built-in Sonde

- Shall be designed to emit continuous magnetic pulses/signals with a working distance of 30' (minimum) air.

- Shall operate with any constant tone, 512 Hz receiver.

- Includes remote ON/OFF capabilities designed to preclude erroneous signals.

Camera Lighting

- Shall be remotely controlled from the control console.

- Shall be integrated into the camera and include four (4) 5W white LED emitters. ·Shall provide adequate lighting in pipe sizes from 6"-48" in diameter.

- CAMERAS THAT REQUIRE EXTERNAL MOUNTED NON-DIRECTIONAL LIGHTING FOR 12" THROUGH 48" PIPE ARE NOT ACCEPTABLE.

ELECTRICAL SPECIFICATIONS and CAMERA REQUIREMENTS Video

Output

- Multi-Conductor Version: 1 V, S/N 46dB or greater

- Single-Conductor Version: FM modulated 9.8mHz to 11.3mHz.

Integrated Lights

- 4 X 5W white LED emitters

- LED power consumption, 20W

- Field Replaceable

- Illumination: 480 lumens

- Color temp: 5500°K

- Optional field replaceable 4 X 6W xenon incandescent lamps [24W max 12V power consumption] with 412 lumens of illumination and 3000°K color temp

Image Pick-up Device

- Interline transfer 1/4 inch CCD color

Picture Elements (pixels)

- Solid state 1/4" diagonal pixels: 768 (H) x 494 (V) = 379,392 elements (NTSC)

Lens

- 10x Zoom f=4.2mm to 42mm (F1.8 to F2.9)

Digital Zoom

- 4x (40x with optical zoom)

Field of View

- 56° diagonal, 46° (H) wide, 4.6° (H) tele end

Resolution Lines

- 470 TV lines horizontal

Electronic Shutter

- 1/4 s to 1/10,000 s, 20 steps

Minimum Illumination

- 1.5 lux @ F/1.8

Input Camera Voltage

- Multi-Conductor Version: 20-72V from controller

Head Rotation

- Axial Rotation: 360°
- Rotation Optical Viewing Angle: 400°
- Lateral Pan: 285°
- Pan Viewing Angle Range: 331°
- Operate in a 6" Relined Pipe
- Rotational Diameter: 4"

Internal Diagnostics

·Humidity sensor, CCD temperature, camera voltage, light head voltage, serial number identification, and operating hour meter.

·CAMERAS WITHOUT THE AFOREMENTIONED DIAGNOSTICS WILL BE DEEMED UNACCEPTABLE.

Working Pressure

- 50 PSI (minimum)

Operating Temperature

- 0° to 50°C

Compatible PCU's

- Multi-conductor Version: 1208 Mainline PCU and Inspector General portable PCU

Compatible Cables

- Multi-Conductor Version: Up to 1200'

Dimensions

- Overall length: 14.5", Head length: 5.9", Body tube diameter: 2.5", Head rotational diameter, 4"

Weight

- 10 lbs.

SONDE SPECIFICATIONS AND REQUIREMENTS

ELECTRICAL

Field Strength

- Measurement Method: FR-1 Receiver with meter reading of "0" at 30 feet in air. Drive

Circuit

- Operating Frequency: 512 Hz.
- Frequency Control: Crystal stabilized
- Power Supply: 12 volts, shared with internal lights power supply

MECHANICAL

Drive Circuit

- Square circuit board to match the inclinometer sensor footprint to ensure that the mounting hardware can be shared.
- Transmitter Antenna Coil
- Shall be built into a modified connector housing.

SELF-PROPELLED Wheeled Compact CAMERA TRANSPORTER - With Proportional Steering

The unit shall be labeled and listed as a minimum by a Nationally Recognized Testing Laboratory (NRTL) to the applicable Standard for Safety for Closed Circuit Television Equipment, UL 2044, 2nd edition, 11/9/01. A listing report must be supplied that certifies the aforementioned equipment is acceptable as defined by 29 CFR 1910.399 and required by 29 CFR 1910.303(a). Self-certification or certification by a laboratory that is not an NRTL will be deemed unacceptable. NRTL labeled and listed equipment shall be supplied as required by the FEDOSHA memorandum, dated September 25, 2002, page 3, Section on Compliance, prepared by John L Henshaw, Assistant Secretary of Occupational Safety and Health.

A self-propelled camera transporter shall be provided for inspecting relined pipe and storm drains/wastewater pipelines measuring 6" and up in diameter. The transporter assembly shall be designed to operate optimally with 1200' multi-conductor cable and shall consist of the following (minimum):

Transporter

- Shall include the following (minimum) equipment: (6) Driven Wheels, available in various sizes.
- Shall operate through a minimum of (1200) feet of multi conductor video cable in suitable pipe conditions.
- Shall utilize a rear tip-up bulkhead connector to minimize stress and strain on the cable connection. The cable-to-transporter connection shall be secured via a twist-locking feature.
- The corresponding pan and tilt or pan and tilt zoom camera shall plug directly into the transporter with no external exposed cables.
- Shall include a two-speed transmission to optimize traction by doubling the torque in difficult pipe conditions or in larger diameter pipe.
- There will be a protected manual shifter assembly on the transporter to facilitate quick gear ratio changes.
- CAMERA TRANSPORTERS WITH A ONE SPEED / GEAR RATIO TRANSMISSION SHALL NOT BE ACCEPTABLE DUE TO THE SUBSTANTIAL REDUCTION OF TORQUE / TRACTION PRODUCED WHEN LARGER DIAMETER WHEELS ARE USED.
- Shall have sufficient power and traction to inspect a minimum of (1200) feet from the manhole entry point in suitable pipe conditions.
- Shall include (2) heavy-duty drive motors specifically designed to meet the power requirements of the system, regardless of size of pipe being inspected.
- The motors shall incorporate over-current protection circuitry.
- Shall be equipped with self-propelled power forward, power reverse, and free wheel capabilities. · Shall be constructed of brass, stainless steel, and aluminum alloy.
- Shall have speed and direction controlled from the control console.
- Shall be retrievable in the free wheel mode by the video cable reel to reduce the normal wear on the drive motor by 50%.
- Shall have full, variable speed in power forward or power reverse modes.
- The maximum speed for camera / transporter assemblies shall be minimum 30 fpm in high gear for pipe configurations up to 15" and minimum 45 fpm in low gear for pipe configurations up to 30".
- CAMERA / TRANSPORTER ASSEMBLIES INCAPABLE OF OPERATING AT THE SPECIFIED SPEEDS WILL BE DEEMED UNACCEPTABLE.
- The transporter connector shall integrate directly to the camera, securing with a cam-locking action for positive sealing and retention.
- The transporter shall have a forward-locking feature to secure the camera, increasing the strength of the camera-to-transporter interface.
- The self- propelled camera carrier shall weigh a minimum of 27 lbs. · The length of the transporter shall not exceed 14.5".
- TRANSPORTERS EXCEEDING 14.5" SHALL BE DEEMED UNACCEPTABLE.
- Shall include full proportional steering with the ability to conduct a complete 360 degree turn within its own radius.

Camera Compatibility

- Shall be designed to be compatible with the CUES pan and tilt III / optical zoom pan and tilt III cameras.
- The transporter, when used with an optical zoom pan and tilt camera, shall fit into an 6" diameter relined pipe and will have the ability to operate in an 8" diameter pipe with offsets.
- ALL TRANSPORTER / OPTICAL ZOOM CAMERA COMBINATIONS THAT ARE UNABLE TO OPERATE IN 6" DIAMETER PIPE WILL BE DEEMED UNACCEPTABLE.
- ALL TRANSPORTER / PAN & TILT COMBINATIONS THAT ARE UNABLE TO OPERATE IN 6" RELINED PIPE SHALL BE DEEMED UNACCEPTABLE.
- The combined length of the transporter / pan & tilt camera assembly shall not exceed 19.56" with the camera in the home position.
- This will allow the inspection and traversal of 6" diameter pipe with off sets or meandering conditions and facilitate entry into short inverts.
- CAMERA / TRANSPORTER ASSEMBLIES EXCEEDING 19.56" IN LENGTH WILL BE DEEMED UNACCEPTABLE.

Tires

·The Transporter shall include (6) wheels, available in various sizes, designed to maximize traction in each pipe size.

- 3.5" diameter tires for 6" pipe and 6" relined pipe

- 4.375" diameter tires for 8" pipe

- 5" diameter tires for 10"-15" pipe

- 7.9" diameter tires for 18" -30" pipe

- Optional Steel Wheels are available for High Traction in 6" relined / 6" pipe

·The transporter shall be capable of inspecting pipes up to 30" diameter with the addition of larger diameter wheels.

·The (2) smaller diameter wheels, designed to help negotiate offsets in larger pipe configurations, shall remain affixed to the middle axle, regardless of pipe size to be inspected.

TRANSPORTERS DRIVEN BY BELTS WILL NOT BE ACCEPTABLE.

TRANSPORTERS WITH EXTERNAL DRIVE TRAIN COMPONENTS WILL BE UNACCEPTABLE. * Kits contain complete sets of wheels.

MECHANICAL CAMERA LIFT

A remote-operated mechanical camera lift shall be provided for pipeline inspections ranging from 18" - 24" in diameter to prevent the need for an operator to enter the manhole to position and reposition the camera height.

Camera height shall be variable from the collapsed position to optically center the camera in the following pipe diameters: 15", to 18", 21", or 24" in the extended position.

INTEGRATED POWER CONTROL UNIT

A fully integrated camera, lighting, and crawler control unit, built into a protective portable thermoplastic case, shall be provided. The control unit shall include a built-in 10.4" solid-state color monitor to display video, system configuration and diagnostic conditions.

A built-in alpha/numerical video character generator and display shall be provided. The data generator shall generate footage count, defect information, and/or free-form comments, for display on the video monitor and recording. A standard (IBM) "QWERTY" keyboard shall be provided for generating defect and commentary entry. The format and position of the on-screen data shall be adjustable, within the video display, to fit pipe conditions or operator requirements. The Character Generator shall have a minimum of 55 preprogrammed defect codes and 70 user programmable defect information codes. WRC and PACP code systems shall be stored and be activated upon demand.

The control center shall operate from a 110VAC or 220VAC 50Hz. or 60 Hz. power source. It shall not be necessary to adjust the camera voltage to accommodate different lengths and types of cable (flexible or integrated push/ rod type). Other external connections shall include a buffered external video monitor output, a USB port, audio and video VCR input/output plugs (4). The Control Center must be capable of operating a mini camera, pan & tilt camera, and pan & tilt zoom camera used with skids or a tractor without the use of external adapter modules.

The built-in video display monitor shall be a 10.4" solid-state color unit.

PORTABLE CONTROLLER

A hand held portable controller for a pan & tilt type camera, steerable transporter and reel will be provided. The controller will be capable of wired operation, and include a weatherproof 24 key membrane panel with indicator lights. Joystick controls will be provided for camera pan and tilt operation and transporter forward, reverse and steerable functions. Camera controls will include focus and iris override, zoom, lights and light intensity, pan and tilt homing, one button auto focus, and diagnostics. Transporter controls will include cruise control and camera lift operation. Reel controls will include retrieve and release mode, and speed [Not applicable on Dolly applications]. The controller shall be fabricated of a high impact plastic

material, and housed in a neoprene boot for protection. A holster shall be provided for storing the remote at the control unit.

PORTABLE CONTROLLER

A hand held portable controller for a pan & tilt type camera, steerable transporter and reel will be provided. The controller will be capable of wireless operation, and include a weatherproof 24 key membrane panel with indicator lights. Joystick controls will be provided for camera pan and tilt operation and transporter forward, reverse and steerable functions. Camera controls will include focus and iris override, zoom, lights and light intensity, pan and tilt homing, one button auto focus, and diagnostics. Transporter controls will include cruise control and camera lift operation. Reel controls will include retrieve and release mode, and speed [Not applicable on Dolly applications]. The controller shall be fabricated of a high impact plastic material, and housed in a neoprene boot for protection. A holster shall be provided for storing the remote at the control unit.

COMBINATION VIDEO TRANSMISSION/TOW CABLE, KEVLAR FIBER ARMORED, - MULTI-CONDUCTOR

A combined video and towing cable shall be furnished in a continuous length of 1000 feet and shall consist of the following (minimum):

Cable

- The cable shall consist of a coaxial core wrapped with a braided wire shield ground return.
- An additional braided wire shield shall encircle both the coax and ground return and shall act as a Faraday shield.
- CABLES WITH ONLY A SINGLE BRAIDED WIRE SHIELD ACTING AS A GROUND RETURN SHALL BE DEEMED UNACCEPTABLE.
- A total of 8 separately insulated and color-coded 20/24 gage standard copper conductors shall be bundled and twisted in groups of 2 with four conductors remaining single.
- To prevent cable breakage when placed under load, all wire bundles, wires, and the coax shall twist in a serpentine pattern for the entire length of the cable so that all wires, including the coax, are the same total lengths.
- CABLES THAT HAVE A 'CENTER' COAX, MAKING IT THE SHORTEST AND THEREFORE THE MOST EASILY BROKEN CONDUCTOR, SHALL BE DEEMED UNACCEPTABLE.
- The cable diameter shall be no greater than .350 inches.
- The cable weight shall not exceed 77 lbs. per 1000 feet.

Cable Jacket

- The exterior of the cable shall consist of an abrasion resistant high-density nylon composite outer jacket embedded with Kevlar fibers to provide the cable with the required towing tensile strength.
- Shall provide a lower coefficient of friction to reduce drag and therefore increase its resistance to wear.

Cable Connection

- The end of the multi-conductor cable shall be equipped with a waterproof scotchcast and/or waterproof metal splice chamber to allow for the direct wiring of the female connectors.
- An adjustable strain relief shall be provided to transfer the cable towing strength from the cable to the camera skids or transporter.
- The termination shall consist of the necessary connectors and dummy plugs.

MOTORIZED TV CABLE DOLLY ASSEMBLY

A portable, motorized cable dolly shall be supplied for storing the TV cable. The Dolly shall have sufficient capacity to hold up to 1000 feet (304.8m) of multi conductor mainline TV cable. CABLE REELS THAT WILL NOT ACCOMMODATE A MINIMUM OF 1000 FEET (304.8m) OF MULTI CONDUCTOR CABLE WILL NOT BE ACCEPTABLE.

The dolly shall be equipped with a continuous contact assembly with a minimum of 12 gold plated

sliprings and levelwind cable handling system. The slipring assembly shall have a load capacity of not less than 10 Amps at 120 Volts. SLIPRING ASSEMBLIES INCORPORATING LISTED HAZARDOUS MATERIALS (I.E. MERCURY) SHALL NOT BE ACCEPTABLE.

The dolly frame shall be constructed of lightweight tubular steel. The entire assembly shall be finished with a rust resistant white epoxy based industrial coating. The dolly shall be equipped with two pneumatic wheels for easy handling. The weight of the dolly shall not exceed 200 pounds (90.718Kg) including cable. The dolly shall not exceed 46" high by 25" wide (1168.40mm high by 635mm wide) to allow for easy movement through doors and passages.

The dolly shall provide free wheel cable discharge and a variable speed 1/4 HP electric take up motor for cable retrieve and rewind. The dolly shall contain up to 1000' (304.8m) of multi-conductor mainline cable.

(DVR-SD) RECORDER

A 100% solid state digital recording unit for manhole and pipeline inspections. The DVR shall record MPEG 4 digital videos in avi format directly to a provided minimum 16 GB SD card in NTSC and PAL formats. It also takes snapshots and stores them in JPEG format. The DVR unit shall allow audio recording and playback via audio line in / out connections. The digital video shall be played back locally or via remote office PC or Laptop using Windows Media Player with the appropriate codec. The K-Lite codec software can be downloaded free of charge and works in conjunction with the Windows Media Player.

Recording Mode Settings:

The DVR unit offers two recording resolutions in accordance with the H.264 digital compression specification:

702 X 480

352 X 240

In addition, three levels of recording quality are selectable which influence the amount of compression:

-High

-Medium

-Low

Indicators:

A green LED provides "Power On" indication and a Red LED provides "Recording" indication.

The video recording shall allow multiple recordings to the provided 16 GB flash drive. The video file name shall be created automatically per each recording.

Vide Storage

The digital videos shall be created direct to a removable SD card.

Video storage durations at High Quality (16 GB Flash drive):

Good: 44 Hours

Better: 22 Hours

Best: 12 Hours

PCU ENCLOSURE FOR DOLLY

GENERIC CCTV SOFTWARE SPECIFICATIONS FOR GRANITE XP ASSET MANAGEMENT & DECISION SUPPORT SOFTWARE FROM CUES

Functional Requirements of the Software

- a. The inspection software shall fully support CMOM activities as defined by the US EPA

- b. The inspection software shall support GASB 34 regulations
- c. The software shall be NASSCO PACP and MACP version 4.4 certified and will conform to its asset assessment procedures.
- d. The software shall offer the ability to quickly click on an asset and see all of the history performed against that asset.
- e. The software's data entry interface shall be intuitive, easy to use, and able to provide on-line help files within the software to assist remote users with questions they may have.
- f. It shall use familiar Microsoft layouts or "panes" that are customizable screens for each user's preferences and job responsibility.
- g. It shall offer tool bars, drop - down menus, "auto - complete" features to speed data entry, and display data with easy Microsoft tree structures.
- h. Users shall be able to "single click" to burn CD / DVD's or generate reports.
- i. The core software or "standard" inspection lite edition used in the field shall maintain a complete database of infrastructure assets (pipelines, manholes, lateral service connections, lift stations, etc.).
- j. The software shall enable users to immediately point to a defect within the video stream.

The panes shall be synchronized, whereby interaction with the main navigation window will determine the display of data in other associated panes. Changes made to an observation, inspection, asset, project, or resulting from a specific filtering criteria, shall display the newly selected properties in all corresponding open panes.

- a. To allow the user to select his / her default preferences as to which panes to view on a regular basis, each of the panes selected shall be able to be "docked" and / or "floating". The user shall have the ability to "dock" the panes side - by - side, place one pane over another, and access each pane through a tab. "Floating" panes shall be able to be positioned anywhere in the application window. The software provider shall provide a common "out - of - the - box" layout scheme for use while performing a field inspection as well as for use in the office to review the collected data.
- b. The user shall be able to change the field labels. The module to change labels shall be part of the system and shall not require third party software.
- c. A pipe graph shall be interactive and the pane viewable during the inspection. The pipe graph shall show service connections with a graphic indicating the location of the connection. The user shall have the ability to control the graphical representation of the observations made during the inspection by selecting any combination of the following features: Connections, Defects, Continuous, Laterals, Informational, and / or Status Bar.
- d. A zoom feature shall be available for the pipe graph that allows the user to select a portion of the pipe with a mouse and zoom to that specific portion. A grid system shall be provided to display the location of a "zoomed" observation within 10 feet.
- e. To start an inspection, the user shall be able to select structure, nodes, or manhole information already within the database. If the data is not available, the operator shall be able to enter the correct information and the information shall be retained in separate tables for future selection. A graph shall be provided for structures that allow for the direction of entry, exit, and flow direction of each main and lateral.
- f. The user shall be able to display live video, playback video, and captured pictures on the screen simultaneously.
 - a. All drop - down look up values shall be customizable by the end user without the use of third party programs.
 - b. The application shall allow for the addition of custom fields available in the user interface without the need of third party applications.
 - c. City Administrators shall be able to set visual mandatory entry fields for both pipe information and defect entry fields and import them into the basic module.

Technical Requirements of the Software

- a. The software shall be coupled with a firmware controller to receive multiple, simultaneous inputs from connected devices to, for example, allow mainline footage, lateral footage, and inclination data to be received into the software without the need for manual input from multiple keyboards.

Database Structure and Requirements

- a. The inspection database shall include an asset - based architecture which allows multiple

inspections to be performed and retained as a historical record for the same physical location (asset). The "project - based" database architecture shall store and immediately show all inspection history for each asset.

- b. The software shall be able to import an entire asset database.
- c. The software shall have the ability to import and retain the entire list of assets despite not ever having generated an inspection.
- d. The inspection database shall have the ability to support and synchronize with multiple data sources, such as Microsoft Access, Oracle 8, 9i & 10g, or SQL Server. All or part of the data shall be capable of being duplicated between inspection databases and exported into multiple formats, such as Granite XP, Access, PACP, Azteca, Hansen, Maximo, GBA, RJN, and ASCII. All or part of the inspection and asset information shall be able to be synchronized between the field and office with built-in automatic validation and error checking.
 - a. The software must be based on Microsoft Windows and be a 32 bit Windows application, compatible with Windows 7, Windows XP SP2 / SP3, and Windows 2000.
 - b. The software must be capable of connection to external systems via an ODBC or OLE DB connection.
 - c. The collected CCTV survey data shall be stored in either a Microsoft Access, SQL or Oracle tables, and be available for use by the system owner.
 - d. Databases shall be able to be created in the default directory or on any writable drive available.
 - e. The Database structure shall have the ability to use Microsoft Jet Engine 4.0 files, Microsoft Access, or an OLE DB database, such as Oracle or Microsoft SQL Server.
 - f. The database shall support simultaneously the following code systems: WRc, PACP, CUES standard and individual custom codes. The "Customer" shall provide the "Contractor" the code requirement prior to inspection creation. The code editor shall provide the ability to add, modify, and / or delete the code systems per the inspection requirements or user's preferences. Each project shall be able to utilize a different code system and units of measurement based on the "Customer" inspection requirements. The "Customer" shall have full and independent access to the code editor for customization needs without the use of third party applications.
 - g. The database structure shall retain information on the various structures found within a Sewer, Storm, or combined system. It is important that the structures, nodes, manholes and pipe identifiers and related attribute information be retained as separate tables from the inspection allowing import of existing data from multiple sources. The data structure allows different projects to reside within a single database. Information gathered in projects shall be available to view by project or by system. Data gathered during project inspection shall be available to view by the selected structure. Therefore, all inspections can be viewed on a structure even if gathered in different projects.

Digital Video Format Capabilities and Requirements

- a. Digital video files (Inspection Videos) shall be captured and / or recorded in the MPEG1, 2, or 4 formats or as specified by the City or County. The Video capture files shall be in MPEG format with linking to the database file(s) (Inspection Observations). The "link" of the video capture file to the database observation file is required and each Observation shall record the name of the video file and the frame number referencing the time in the video when the inspection was made. The inspection observation(s) shall link to the video record in real time.
- b. A Main, Lateral, or Node Inspection may have one or many linked video files. Video recording can be paused and then restarted without generating a new file.
- c. On playback, single click selection of a Main, Lateral, or Node Observation shall start the video from the moment the observation was made, and subsequent selections of observations will "jump" the video playback to the corresponding spot. If no additional observation selection is made, the software will play sequentially all linked videos in the inspection.
- d. Video linking to pipe inspection observations is a patented and protected technique and only software that holds the appropriate licenses is deemed acceptable.

Image (Photos) Capture Format Capabilities and Requirements

- a. The Inspection image files (pictures) shall have the ability to be exported to Industry Standard Formats to include JPEG, BMP, and TIFF formats and will be transferable by disk, DVD, and / or External Hard Drive to an external personal computer utilizing standard viewers and printers.

- b. The video image capture module shall be capable of collecting multiple color video frames of the defects found during inspection and then linked to the inspection reports. There shall not be a limitation to the number of pictures allowed per observation.
- c. Images or video clips shall be easily launched for viewing during inspection report review.
- d. Images can be captured and linked to an observation directly from "live" video during the TV inspection, or from the video playback at the office.
- e. Footage count shall be attached to the corresponding video image and shall appear on the reports indicating the correct footage when the image was captured during the pipeline inspection.
- f. Shall be able to print any captured image on the ink jet color printer in the inspection truck. Pictures shall be stored and exported with inspection data.
- g. A "thumbnail" preview of all pictures at an observation shall be available. The pictures shall be able to be expanded from thumbnail to window to full screen by utilizing the mouse.

Export of the Database - Capabilities and Requirements

- a. The database, videos, and pictures shall have the ability to be "Exported". Export is the process of selecting all or portions of the original data, video, and pictures and creating a complete and independent copy of this information, which can be run independently or synchronized by a City's or County's office program.
- b. The office program shall have the ability to select the Assets and Projects to transfer to a particular database.
- c. All or part of a database can be exported from the TV Inspection database with or without videos and pictures. This new file can be burned to a CD / DVD, or transferred to a USB hard drive and brought into the office from the truck or to the truck from the office. If the TV Inspection system is connected to the customer's computer network, it will be possible to export the data directly to the a master or central database.
- d. The NASSCO export process will validate the PACP and MACP data and reject any non - compliant inspections, notifying the user via log files so that a corrective action can be implemented.

Synchronization Capabilities and Requirements

- a. The application shall have the ability to synchronize with assets and inspections from exported databases.
- b. The synchronization process shall have built-in error checking for duplicates, conflicts, updates, and any modifications to the data being synchronized using a unique hash revision control mechanism for every data object.
- c. The software shall have an OPTIONAL Scheduler module that allows for a daily, weekly, or monthly scheduled transfer of information between two databases (i.e., central office to truck, truck to master database, etc.). Inspections for an asset shall be able to be sent to the truck from the office.
- d. Synchronization and Exporting activities can be independently scheduled.
- e. Log files must be created for review purposes.
- f. During the synchronization process, validation dialogs shall be used to allow the users to select which data takes precedence when a conflict is challenged.
- g. All filtering capabilities previously described must be available for all exporting and synchronization tasks.
- h. The application will allow for multiple sources of data to be effectively consolidated into a single unitary database for analysis and evaluation.

Televising Survey Collection / Reporting Capabilities and Requirements

- a. The software's basic module shall be capable of providing complete survey reports.
- b. The software shall be capable of customization with the ability to modify / add to the pipeline condition descriptions / codes and to group them for ease of use.
- c. The software shall allow footage reading from the existing mainline and lateral camera equipment to be automatically entered into the current survey record and directly correspond to the noted defect location throughout either the main or lateral pipe graph and tabular reports generated.
- d. A context - sensitive, complete on - screen help file should be available.
- e. Drop - down boxes shall be available to quickly reference common information such as defects, pipe materials, survey purpose, locations, pipe usage, etc.

- f. Multiple windows shall be allowed so as to display live video compared to recorded video and / or recorded snapshots.
- g. The software's basic module database shall have the means to sort in ascending and descending order according to date, pipe ID, street name, structure ID, observed footage, pipe materials, pipe diameters, work order numbers, etc.
- h. Summary reports compiling data from multiple inspections shall be available. Reporting order shall be user defined.
- i. Individual inspection summary reports shall also be available and tabulate pipe survey results.
- j. Quarter section (or map or project areas) summary reports are to be made available so that all surveys within a quarter section are listed showing purpose of inspection, dates, work order numbers, structure ID's, street names, and total lengths.
- k. A report showing defects by inspection shall be available and programmable to list specific defects observed with corresponding footage, starting, and ending manhole numbers, structural pipe defects (i.e. cracks, offsets, defective laterals, collapsed pipe, etc...) and service oriented defects (i.e. roots, grease, obstructions, infiltration, etc.).
- l. A report showing grading scores shall be available and summarize the structure ID's, pipe material and pipe diameter, and the grade scores for each survey with totals.
- m. Reports showing service and structural aspect scoring shall also be available and shall list the pipe ID, total observed length, number of defects and total score with reference to the condition of the total pipe, average of the pipe, total defects and average of defects.
- n. The software shall allow users to create additional reports as needed.
- o. The data structure shall allow different projects to reside within a single database. Information gathered in projects shall be available to view by project or by unique system ID number or asset ID. Data gathered during the project inspection shall be available to view by the selected structure. Therefore, all inspections can be viewed on a structure even if gathered in different projects.
- p. The data structure shall allow for the entire asset data inventory to be created or imported even if no inspections have been performed on the assets.
- q. The software shall allow the user to track pipe cleaning operations and perform cleaning surveys using dedicated data fields and procedures. The Granite XP Cleaning Code System is deployed on sewer and storm water cleaning, jetting and pumping vehicles (Vactor, Vac - Con, Pipe Hunter, Guzzler, etc.) to integrate cleaning activities to CCTV operations for more effective coordination and management of labor and equipment. Cleaning crews can flag failing assets needing immediate attention as well as lines that have been cleaned and are ready for CCTV inspection or part of an overall maintenance program.

Televising Viewer Capabilities and Requirements

- a. A viewer module shall be available for viewing all collected data and shall allow users to :
 - a. View or print all available pictures.
 - b. View all available video files.
 - c. Review or print individually all available reports.
 - d. View all data in the same format as the main software application.
 - e. Use GIS map within the viewer to select assets, review inspections, and run reports.
 - f. Use predefined and custom filters to search and sort the information and reports.

GIS and GPS Requirements

- a. The inspection software will integrate with GIS, GPS, and selected CMMS systems.
- b. The Database and Software program shall be able to import and export asset data, Inspection Observations, and pipeline inspection scores from an ArcGIS 9.3 shape file, personal geo-database file, or ArcSDE files utilizing the network features to associate Sewer, Storm, or combined Mains with corresponding Node and Lateral Assets.
- c. Both an "import" and "export" profile shall be provided in the software to strictly control the attributes exchanged between the systems.
- d. The software shall provide the ability to browse to the profile location to select different profiles.
- e. The "import" and "export" profiles shall allow for data type conversions when the source and destination field types are not the same (i.e., allow for data type conversion of a float to an integer).
- f. Imported asset data from GIS, as well as exported asset data to GIS shall be filterable to bring in all asset data (full asset inventory) or selected assets / pipelines.

- g. The inspection software shall allow linear references to be created in GIS with corresponding hyperlinks to spawn video, still images, and other data from the inspection software or an ESRI GIS application.
- h. An interactive and integrated GIS map shall be viewable from within the application and allow for the initiation of inspection, creation of multiple inspections in a project format, viewing, exporting, burning, and reporting of inspections for selected assets, map layer management, and customizable filtering capabilities for selection of map features.
 - i. The software shall provide an ArcGIS - style identify tool on the integrated map view pane.
 - j. The software shall provide an ArcGIS - style measure tool on the integrated map view pane.
 - k. The software shall provide an ArcGIS - style find tool on the integrated view pane.
 - l. The software shall collect real - time submeter accurate GPS coordinates wirelessly from the field for located structures.
- m. The software shall allow collection / storage of GPS coordinates imported from an existing GIS database.
- n. The inspection software shall provide a "zoom to GPS location" capability when a GPS device is connected to show the location of the inspection vehicle or a particular known structure's location.
- o. The software shall enable structures, observations, entry points, etc., to be estimated with GPS coordinates as a linear reference.
- p. The software shall provide the ability to select multiple inspections and provide an estimated GPS coordinate for all observations.
- q. The software shall provide the ability to estimate GPS coordinate for a node asset using the inspection observation's estimated coordinate.
- r. The software shall provide the ability to use the GIS map within the viewer to select assets, review inspections, and run reports.
- s. The software shall provide the ability to import GIS subtypes.
- t. The software shall provide the ability to check and / or correct the GIS source file name if that name and / or location changes between imports.
- u. The software shall provide the ability to estimate node asset coordinates by clicking on a map.
- v. The software shall provide the ability to zoom to a selection in the map view pane from a navigator context menu.

Televising Data Analysis / Reporting Capabilities and Requirements

- a. Users shall have the ability to check for invalid data. To avoid corruption, data gathered from the field inspection shall be error checked. Inconsistent or erroneous data shall automatically be displayed and allow the user or supervisor to add or change data before being input into the database.
- b. Users shall have the ability to perform data entry and automatically control the video text overlay simultaneously to eliminate the need for dual entry.
- c. Users shall be able to directly access Oracle 8i, Oracle 9i, and Microsoft SQL Server 2000 / 2005 databases.
- d. Users shall have the ability to transfer data between the Data Acquisition System and the Software Interface without the need for any user supplied programming, special scripts, or macros.
- e. The user shall be able to build a code system from active codes.
- f. The administrator shall be able to select asset and inspection fields that can updated without user verification, therefore allowing quick transfer.
- g. The application shall have the ability to filter all data using any data field in the application. Filter state should be savable for future use. Multiple filters can be saved. Filters can be defined graphically or by SQL query language.
- h. Users shall be able to filter the list of mainline inspections or assets to be exported. Users shall be able to select the mainline inspections by:
 - a. Data Acquisition System projects, filtering by: Project name.
 - b. Inspections, filtering by date (from / to), operator name, or work order number.
 - c. In addition, the user shall be able to filter the mainline inspections by Sewer Main Assets:
 - a. The user shall be able to select a list of Main Assets and the inspections associated with the assets shall be displayed.
 - b. The user shall be allowed to select / deselect individual inspections.
- i. A scoring system incorporated in the software shall assist the user / management personnel in

making proper pipe condition assessments. Scoring is to be based upon grades assigned to observation codes and calculated using either standard or customer specific algorithms. Grade can be programmed to be dependent to secondary properties like pipe size, type, weather, etc. Only administrators shall be allowed / able to make changes to grade and scoring algorithm values.

j. Upload / download features shall be available to move surveys, assets, or projects between databases allowing information stored on a truck system to be incorporated into a master database on the City's network or a supervisor's computer. The software program shall be able to combine databases from multiple sources into a master database. A revision control system shall automatically monitor changes and resolve conflicts between databases.

Vendor Requirements

a. Vendor shall design, develop, and support the software in the US. The software shall not be designed and supported offshore.

b. Vendor shall offer comprehensive Annual Support Plans, which include Web - based troubleshooting tools, online assistance, user forums, and access to downloadable upgrades and documentation via an established Support web site.

c. Vendor shall provide references similar in size and scope.

PACP MODULE SOFTWARE

The module is certified by NASSCO to support the PACP defect identification code system. The system will import and export to the PACP file format.

TIGER TAIL

A standard 4" diameter Tiger Tail wastewater jet hose guide shall be provided for maximum downhole TV cable protection.

MANHOLE TOP ROLLER ASSEMBLY

A manhole top roller assembly shall be provided to protect the TV cable entry at the manhole cover ring. The roller assembly shall be a welded steel frame incorporating a minimum 6" diameter cast aluminum roller.

RETRIEVAL/DOWNHOLE POLE ASSEMBLY

4.8 foot (57.5") quick coupling spring loaded extension pole will be supplied to connect to the down hole cable guides. To minimize weight, the quick coupling extension poles shall be constructed of .125" thick fiberglass tubing with an outside diameter of 1.25". The fiberglass tubing shall consist of 1 ounce continuous strand matt encapsulated with vinylester resin. The weight per each pole shall not exceed 2.8 lbs. The extension poles shall be corrosion resistant and orange in color to ensure visibility for added safety.

INSTRUCTION AND TESTING

The supplier shall fully instruct and test buyers in the operation of the equipment furnished after delivery. The instruction period shall be of sufficient duration (number of days shown on the component list) to fully familiarize the buyers operating personnel. The instruction and testing shall be conducted by the supplier's field service technician and shall include component familiarization, theory of operation, equipment operation, field procedures, techniques of use, troubleshooting, maintenance recording and logging of sewer conditions and safety procedures. Training provided by sales or office personnel will not be acceptable.


PACP CERTIFIED SOFTWARE

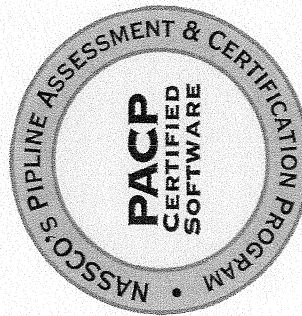
NASSCO's Pipeline Assessment & Certification Program (PACP)

Granite XP Enterprise - Version 5.0.0

CUES

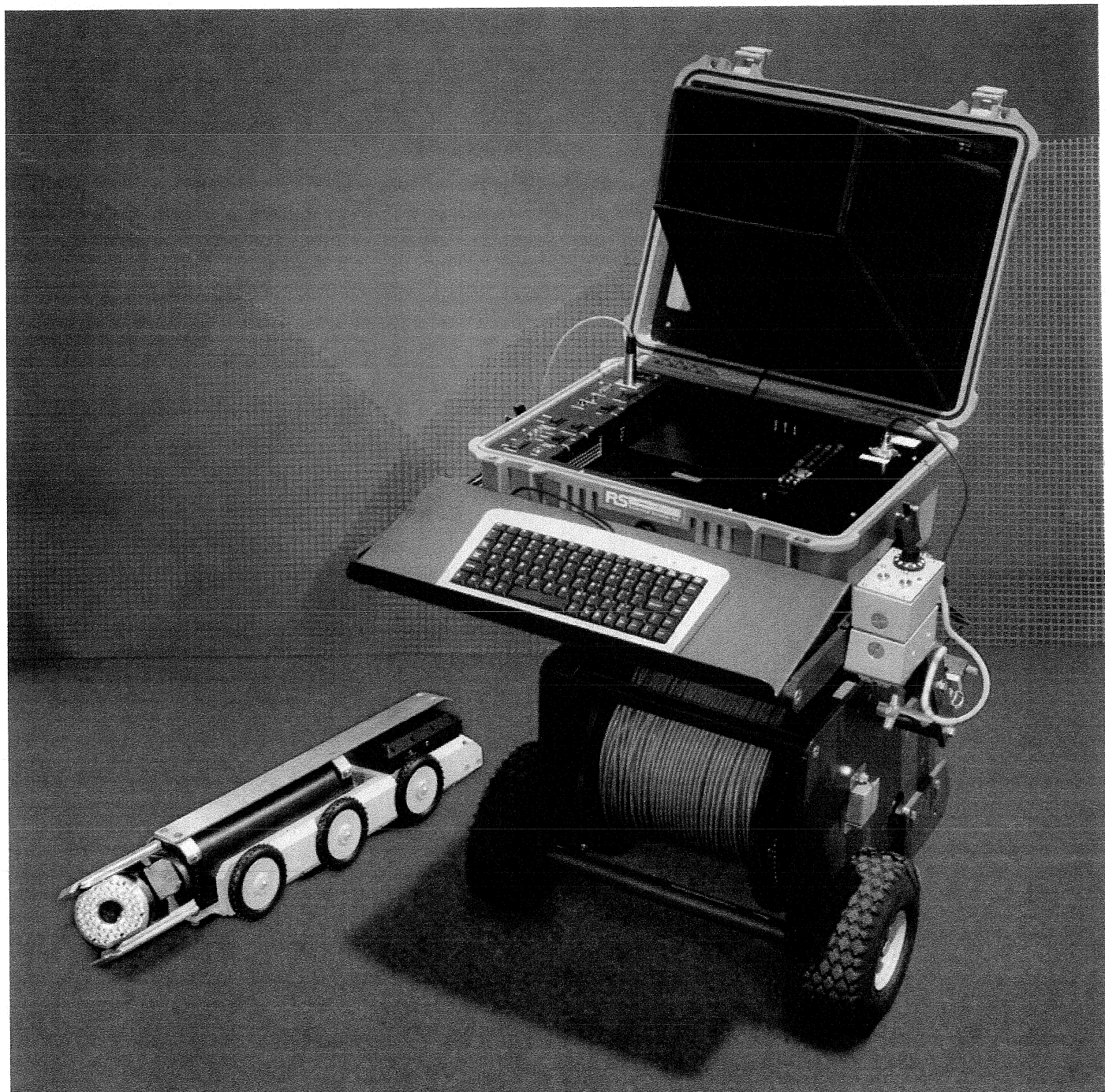
This document hereby certifies that the above referenced software has been tested for version 6.0 of the Data Dictionary. It contains & properly implements PACP© Codes, Imports Data correctly and Exports properly to the 6.0 NASSCO Standard Database.


Ted DeBoda, P.E. Executive Director 3/20/12 Date



V6.0

Private Eye II (PE2)

font size . . . [Print](#)

R.S. Technical Services, Inc. (RST) is excited to introduce its new Private Eye 2 Portable Mainline Inspection System. The Pi2 command center is enclosed in a Pelican® waterproof and crush proof case that measures 18.43" x 14.43" x 7.62" and weighs just 30 lbs, giving the user extreme portability without sacrificing field durability.

The Pi2 is compatible with all RST cameras and tractors (shown here with the TranSTAR 6-wheel drive tractor and NovaSTAR pan & tilt camera) and when combined with a Compact Portable Reel (CPR) loaded with single conductor cable, is capable of inspecting 4" to 200" diameter pipelines up to 1,500' in length.

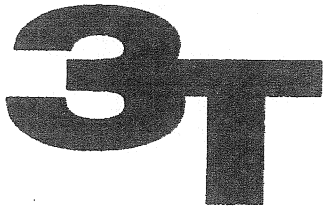
Options include: sun readable monitor, text writer and laptop data collection software.

This is the perfect pipeline inspection system for easements, off road manholes or any hard to get to situation.

Features:

- TFT LCD flat screen monitor
- On-screen footage display
- Automated power adjustment
- MPEG Video recording capability

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3T EQUIPMENT COMPANY, INC.

SAFETY, PIPE INSPECTION AND SEWER MAINTENANCE
EQUIPMENT FOR THE PROFESSIONAL

April 24, 2012

City of Rio Dell
Attn: City Manager
675 Wildwood Ave.
Rio Dell, CA 95562

RE: RFP Submittal for Portable Mainline Rotating Head Sewer Television Camera System

To Whom It May Concern:

3T Equipment Co. is submitting a proposal for an R.S. Technical Services, Private Eye 2 System with the Pipeline Observation System Management (POSM) Software, Lite Edition; per the published specifications for the above mentioned RFP, in the amount of \$46,579.04

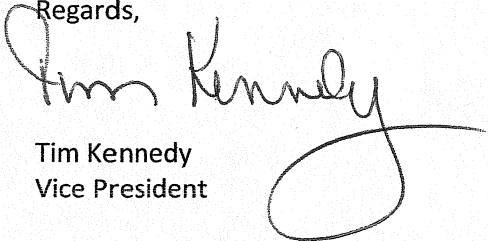
We take no exceptions to the published bid specification.

The above amount includes Training & Delivery. Sales Tax is not included in the price

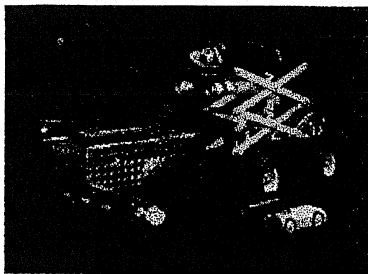
We appreciate the opportunity to earn you business.

If you have any questions regarding this submittal, please feel free to contact 3T Equipment Co. - Tim Kennedy @ (707) 799-5997 or (800) 969-3001.

Regards,



Tim Kennedy
Vice President



RS Technical Services Inc.

Design and Manufacture of Video Pipeline Inspection Systems

Quote Number:
120072

Rick Chicora
City of Rio Dell
675 Wildwood Avenue
Rio Dell, CA 95562
Phone: (707) 764-3541
Fax: (707) 764-5480

1327 Clegg Street
Petaluma, CA 94954
707/ 953-7185 Fax: 707/ 676-8051
chrisr@rstechserv.com

Date: 4/23/2012
Expiration: 5/23/2012
Salesperson: Tim Kennedy

Sales Quotation

Part #	Description	Price	Qty	Extend
011-02002-11	Private Eye 2 POSM Ready Portable Mainline System To Include: (1) - 1375 Mini mainline system controller with POSM version video overlay (1) - Audio recording microphone (1) - Frame mounted, compact cable reel (1) - Single conductor, steel armored television cable, 500' (1) - Wheeled frame/cart assembly		1	
569-20283	Single Conductor, Steel Armored Cable, Per Foot (Total 1000FT)		500	
010-01102-01	Auxiliary Handheld Controller With All Zoom Camera And Tractor Transporter Functions, Equipment Room		1	
010-01103-01	Auxiliary Desktop Controller, Dual Tone, Zoom, Joystick		1	
040-04300-051	Winlogger P.O.S.M. Lite MPEG Data Acquisition Laptop System, 1375 Version (1) - Winlogger P.O.S.M. Lite Laptop (1) - MPEG Encoder with cables (1) - P.O.S.M. Lite software (1) - 30 day basic software support		1	
010-01655-30	TrakSTAR II Pan & Tilt Zoom Camera, NTSC, Single Conductor (1) - TrakSTAR II rotating head zoom camera, 6 pin, with LED lighting (1) - Camera case		1	
806-37583	Cable, 3 Pin X 6 Pin With Sonde Transmitter, NovaSTAR or TrakSTAR Camera version		1	
032-02500-10	TranSTAR II Steerable, Inspection Transport Vehicle, Single Conductor (1) - Mainline steerable tractor, 6 pin (1) - Tractor to camera power cable (6) - Standard tires (1) - Tractor extension kit (1) - TranSTAR Insertion/Retrieval Assembly (1) - Tractor storage rack (1) - Tractor operations manual		1	

Part #	Description	Price	Qty	Extend
867-34822	High Traction Caster Wheel, TranSTAR Tractor		6	
840-35686	MegaTRAK wheel kit, TranSTAR Tractor		1	
	Includes:			
	(6) - Hub assemblies			
	(6) - 2.70" diameter wheel rings			
	(6) - 3.30" diameter wheel rings			
	(4) - 4.40" diameter wheel rings			
	(1) - Snap ring pliers			
867-34843	Knobby Balloon Wheel, TranSTAR Tractor, Each, Qty (4)		4	
	Required			
860-37376	6" X 2" Pneumatic Wheel Assembly, TranSTAR Tractor, Each, Qty (4) Required		4	
805-13737	Top Manhole Roller		1	
867-15975	Lowering Rope With "D" Ring, 35'		1	
569-18088	Tiger Tail		1	
	Subtotal			\$56,973.80
	Less Municipality discount			(\$11,394.76)
950-34226	Technical Support, P.O.S.M. Lite Software, One Year	\$1,000.00	1	\$1,000.00
950-18224	Camera & Tractor Warranty, Months		24	
950-18224	Reel & Cable Warranty, Months		60	
	Additional Options Not Included in Quotation			
052-36988	Location Detector/Receiver	\$1,575.00		
	Upgrade to POSM Pro Laptop System (cost is in addition to base price quoted)			
040-04300-04	Winlogger P.O.S.M. Pro Data Acquisition Laptop System	\$4,905.00		
	(1) - Winlogger P.O.S.M. Pro Laptop			
	(1) - P.O.S.M. software with MPEG video and JPEG snapshots			
	(1) - 30 day basic software support			
950-33941	Technical Support, P.O.S.M. Pro Software, One Year	\$500.00		

Sub-Total \$46,579.04

Tax

Total \$46,579.04

+ 4,905.00
 + 1,575.00
 + 500.00
 53,559.04
 tax 3,883.03
 57,442.07

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RST Product Warranty Periods

Effective January 1st, 2008

PRODUCT TYPE	6 MONTH WARRANTY	1 YEAR WARRANTY	COMMENTS
LASER PROFILER		X	
MEASUREMENT TOOL		X	
WATER DEPTH GAUGE		X	
INVESTIGATOR		X	
LATERAL LAUNCHER SYSTEM		X	
OMNI-II ZOOM		X	
OMNI-III ZOOM		X	
OMNI A / STAR		X	
NOVASTAR		X	
EXPLOSION PROOF CAMERA		X	
1306 MINI CAMERA	X		
1530 MINI CAMERA	X		
1535 MINI CAMERA	X		
STD PUSH REEL	X		
SONDE PUSH REEL	X		
1309 CONTROLLER		X	
13XX CONTROLLER		X	
15XX CONTROLLER		X	
PRIVATE EYE CPR		X	
STD CPR		X	
SPEED CONTROL CPR		X	
MAINLINE REEL		X	
CONTROLLER M/L REEL		X	
COMPUTER SYSTEMS		X	Software Support from RST. Hardware Support from Manufacturer
COMPUTER OVERLAY		X	Software Support from RST. Hardware Support from Manufacturer
DD LITE		X	
TRACTOR TRANSPORTS		X	
TRANSTAR TRANSPORTER		X	
CRAWLERS		X	
STORM DRAIN TRACTORS		X	
MINI TRACTORS		X	
TRUCK INSTALLS		X	
MECHANICAL FOOTAGE	X		
SKY CRANE		X	
LARGE LINE LIGHTS	X		
DESKTOP/HANDHELD CONTROLLER (AUX. BOX)		X	

NOTE: Please refer to R.S. Technical Services Limited Warranty Policy.

RST OFFERS AN EXTENDED WARRANTY POLICY.

PLEASE CONTACT YOUR REGIONAL SALES MANAGER OR INSIDE SALES FOR A QUOTE.

Limited Warranty Policy

- R.S. Technical Services, Inc. (RST) warrants all items **of our manufacture** for defects in materials and/or workmanship from the date of receipt by the Customer. See charts that follow for specific warranty periods. See page 22 for exception list.
- Any repair on current product performed by authorized RST personnel is warranted for ninety (90) days.

This policy is limited to items manufactured and repaired by RST.

In the event of any malfunction or failure of RST equipment or parts, the Customer is required to request authorization (prior to any repair) from RST to return the defective items by contacting their local Distributor and requesting a MRA (Merchandise Return Authorization) number.

The returned equipment or parts shall include a MRA form that the Customer has filled out completely. This would include customer name, address, contact info, MRA number, part identity, serial number, and the reason for the return. A MRA form is available by contacting RST at 800-767-1974.

Freight costs are the responsibility of the Customer unless otherwise agreed to by RST.

All in warranty equipment and parts being returned shall be shipped to:

R.S. Technical Services, Inc.
1327 Clegg Street
Petaluma, CA 94954
707-778-1974

OR R.S. Technical Services, Inc.
292 Midland Trail
Mt. Sterling, KY 40353
859-499-0122

- RST reserves the right to determine whether a product is eligible for warranty repair. RST shall at our option, repair or replacement for credit.
- Not covered by this policy are expendable or wear out items to include but not limited to light bulbs, drive belts, cables, skids, bridles, tires, axles, stripped screws and connectors. The vehicle, generator, air conditioner, monitors, video recording devices, and computer hardware shall be covered by the Manufacturer's warranty and any services shall be referred to each Manufacturer's service organization.
- No warranty shall be applicable to malfunctions due to damage (including shipping), neglect, wear, misuse, or improper handling or repairs to any part of the equipment.
- The warranty will be voided if repairs are made by persons other than RST authorized personnel or repairs not made in accordance with and covered by RST service manuals, or repairs utilizing parts or materials not equal to those furnished by RST.
- On rare occasion, RST may warrant on-site repair of equipment. To become eligible for travel reimbursement, you must contact RST Technical Support for authorization. RST Technical Support shall determine whether to replace any defective part or component in our service facility, or ship the customer a replacement part or component. The Customer shall return a defective part or component within (10) working days after receipt of the repairs. Criteria for determining travel authorization shall include multiple problems and customer relations. It is the responsibility of the Distributor to inform RST Technical Support of problems early in the process.
- Warranty claims that do not reference a valid RST model and serial number shall be returned unpaid.
- Parts must be returned for credit. Return of small items may be waived at the sole discretion of RST Technical Support. Requests for reimbursement of parts shall require an RST Invoice Number.
- Equipment needing warranty repair shall be returned to RST or an authorized warranty facility at the expense of the Customer.
- RST shall not be liable for any consequential or incidental damages to persons or properties resulting from the use of or any breach of warranty expressed or implied, to RST items manufactured or repaired.
- The responsibility of R.S. Technical Services is set forth above.

Loaner Equipment Program

R.S. Technical Services, Inc. has an established pool of RST equipment to be used in the RST Loaner Equipment Program. This program provides RST Customers with a minimum downtime in an emergency if their equipment is in need of repair.

All RST Customers must make a request for RST Loaner Equipment through their Distributor unless they are direct. All requests must be done using the **RST Loaner Request Form**. FAX it to RST at (707) 769-8806. RST will respond ASAP on Loaner availability. If you are traveling please have someone in your office fax this request for you.

RST Loaner Equipment will be provided on an "as available" basis at no charge to the Customer. RST will cover normal outbound shipping charges **if** the Customer's equipment is under warranty.

RST Loaner Equipment will be shipped out on the date of the request (if available), Priority Overnight at no charge to the Customer **if** their equipment is under warranty. The Customer will be responsible for outbound shipping charges if their equipment is not within the warranty period. **The Customer agrees to send in their equipment to RST for repair within 24 hours of receipt of the RST Loaner Equipment with a completed MRA Form.**

Any malfunctions of the RST Loaner Equipment should be reported to RST *immediately*. *The Customer will be held responsible for any necessary repairs as a result of abuse or misuse of RST Loaner Equipment.*

The Customer is required to return the RST Loaner Equipment *within 48 hours* of the receipt of their repaired equipment. The Customer will be responsible for shipping back the RST Loaner Equipment. *Return shipping costs for Loaner Equipment are always the responsibility of the Customer, regardless of repair warranty.*

Upon the receipt and use of RST Loaner Equipment, the Customer agrees to abide by the above stated terms. Failure to comply with the above stated terms may result in the loaner being deemed a loaner rental and/or affect future loaner privileges.

Loaner Rental Charges:

RST will allow for sufficient shipping time in the above specified terms. The Customer will be charged a loaner rental fee if RST Loaner Equipment or Customer equipment repairs are not shipped to RST within the time period specified in the above terms. The daily rental rate is \$250. The weekly rental rate is \$1,000.

Before loaner rental charges are applied, RST will notify the RSM, Distributor and/or the Customer by e-mail. This notification will include the Sales Order number, the date the repaired equipment was returned, the FedEx tracking number and the type of loaner equipment.

MME

Municipal Maintenance Equipment

2360 Harvard Street • Sacramento, CA 95815 • (916) 922-1101 • Fax: (916) 922-1034
1061 N. Shepard Street, Unit B • Anaheim, CA 92806 • (714) 632-2871 • Fax: (714) 632-2874
4750 Caterpillar Road, Unit D • Redding, CA 96003 • (530) 243-4856 • Fax: (530) 243-1447
1930 W. Winton Ave., Suite 8 • Hayward, CA 94545 • (510) 670-0230 • Fax: (510) 670-9003

April 24, 2012

City of Rio Dell
675 Wildwood Avenue
Rio Dell, CA 95562

Attention: City Manager

RE: Request for Proposals – Sewer Camera System
Due April 25, 2012 4:00 p.m.

We are pleased to provide the following proposal in response to your Request for Proposals for a Sewer Camera System for your consideration.

Main Bid

One (1) Each Aries Industries Portable Pathfinder Inspection System per the attached Aries Component List and Detail Specifications. Delivery 4-6 weeks A.R.O.

Price F.O.B. Rio Dell, CA	\$ 63,007.00
7.25% Sales Tax	<u>4,568.00</u>
Total	\$ 67,575.00

Alternate Bid

One (1) Each Aries Industries Portable Single Conductor Inspection System per the attached Aries Component List and Detail Specifications. Delivery 8-10 weeks A.R.O.

Price F.O.B. Rio Dell, CA	\$ 64,604.00
7.25% Sales Tax	<u>4,683.79</u>
Total	\$ 69,287.79

- Proposals include delivery and on-site training.
- Terms Net 30.
- Proposals valid for 30 days.

Nearest parts and service locations

Municipal Maintenance Equipment, Inc.
4750 Caterpillar Road, Unit D
Redding, CA 96003

Aries Industries
5748 East Shields Avenue
Fresno, CA 93727

April 24, 2012
City of Rio Dell
Request for Proposals – Sewer Camera System
Page 2

Thank you for the opportunity to provide this proposal! Should you have any questions or need additional information, please let us know. We look forward to being of service.

Respectfully submitted,
Municipal Maintenance Equipment, Inc.



Nancy Steffan,
Corporate Secretary

Enclosures

**Sewer Camera System**

This sewer television system is delivered complete, ready for operation. The system includes a pan & tilt camera and transporter with light head capacity from relined 6" to 24" lines. Components can be used with the base unit including a small diameter color camera for pull, push or tractor applications.

COMPONENT LIST**1 System Control Unit ("SCU") assembly mounted in a Hardigg-style, ATA airline-rated shipping case. Major built-in components are:**

- 1 Non-glare 9" color TV monitor, with 3" internal speaker and controls
- 1 Monitor sun shield
- 1 Video recorder bypass switch
- 1 Set of video recorder audio and video jacks
- 1 Microphone jack
- 1 Audio recording microphone
- 1 Camera power selector switch, micro/mainline
- 1 Light power selector switch, micro/mainline
- 1 5-position lighthead selector switch
- 1 Lighthead protection system with an auto reset circuit breaker and trip indicator light
- 1 Lighthead intensity control knob
- 1 AC power switch with indicator light
- 1 Set of individual circuit breakers for AC power input/lighthead power output/camera power output
- 1 120V AC power input GFI protected plug with cord
- 1 120V AC duplex GFI protected outlet
- 1 Military connector for SCU to reel interconnect cable (prewired for push reel, pull reel, tractor and on-screen footage features)
- 1 Multi-function system diagnostic test meter with concurrent volt and amp LED readout
- 1 Storage compartment mounted in shipping case protective cover
- 1 Expansion slot and keyboard tray position for VL5000 data display module and keyboard

1 Aries VL5000 Video Data Display and Report Writer System with:

- 1 Data display control module, panel mounted
- 1 Alphanumeric full "QWERTY" keyboard for video titling and report data input (must be built in control unit for storage safety)
- 1 Connections for use with laptop computer

1 Portable video capture and review system, including:

- 1 Capture unit to compress video in MPEG4 format
- 1 16GB SD card with USB adapter
- 1 Set of interconnect cabling

1 Laptop computer, with minimum features including:

- Intel processor
- 250 GB SATA Hard Drive
- 4 GB RAM
- 8X DVD±R/W, 4X+DL optical media drive
- Smart Li-ION battery
- Integrated 10/100/1000Mbps Ethernet LAN & wireless 802.11a/b/g/n wireless module
- Full sized keyboard and touch pad pointing device
- 1 Windows 7 operating system software

1 POSM Pro software and license

- 1 Video capture hardware kit

1 Pathfinder cable and reel assembly, including:

- 1 Lightweight frame, drum and motor assembly with clutch and cable level wind assembly
- 1 Footage meter with local LCD footage display and encoder for footage signal to remote video data display system
- 1 Emergency hand crank arm
- 1 1000' of lightweight low friction multi-conductor cable
- 1 Sealed continuous contact collector assembly, 12 slip rings minimum
- 1 Telescoping swivel cable guide roller assembly
- 1 Interconnect cable to TV system electronics
- 1 Removable wheeled dolly frame

1 Aries PE3400 Pathfinder series zoom pan and tilt camera w/ high intensity LED light ring, including:

- 1 Pathfinder zoom pan and tilt camera w/ 360° continuous rotation
- 1 40X zoom (10X optical & 4X digital)
- 1 Maintenance-free forward facing true color warm white directional LED lighting modules, positioned in the arms of the camera
- 1 Maintenance-free true color warm white directional LED directional lighting system with for inspecting up to 36" pipelines
- 1 White balance optimization with (4) selectable settings
- 1 "Starlite" light enhancement feature with (4) user selectable enhancement steps
- 1 "One Touch Scanning" feature with (2) user selectable continuous joint scan presets
- 1 "Quick Look" preset view positions (6) (Up, Down, Right, Left, Lat R, Lat L)
- 1 Fast-check pressure monitoring system
- 1 On-screen camera diagnostics functions including:
 - Camera model, serial number, software revision
 - Camera operating hours, regulated voltage value, head temperature
 - Camera internal pressure, control error recognition, LED current value
- 1 Camera/tractor storage and transport case
- 1 Spare parts / camera recharge kit
- 1 Test cable, Pathfinder system
- 1 Desktop dual mode camera controller including: joystick for axial rotation and pan and tilt angle; remote focus; zoom in/out; home, diagnostics, white balance, Starlite, and preset switches



1 Aries TR3300 Pathfinder steerable self-propelled transporter for relined 6" to 24" lines, including:

- 1 Tractor assembly with continuous duty drive motors
- 6 3 $\frac{3}{8}$ " rubber wheels for relined 6" lines
- 4 4 $\frac{3}{8}$ " rubber wheels for 8"-15" sewer lines
- 4 4 $\frac{3}{8}$ " extended hub rubber tires for 10"-18" sewer lines
- 4 5" extended hub rubber tires for 12"-24" sewer lines
- 1 Fast-check pressure monitoring system
- 1 Manual camera lifting mechanism
- 1 Rear viewing camera with LED lighting
- 1 Auxiliary high power detachable light head
- 1 Storage and transport case
- 1 Set maintenance parts
- 1 Hand-held Pathfinder series tractor controller
- 1 Tractor power supply and control interface box to SCU
- 1 512 Hz detachable locating beacon
- 4 5" diameter "dually" rubber extended wheels
- 2 3" carbide impregnated high traction wheels
- 2 4" extended hub carbide impregnated high traction wheels
- 2 5" extended hub carbide impregnated high traction wheels

1 Cable manhole guide system including:

- 1 Manhole top roller assembly
- 1 Insertion and extractor pole assembly and tractor adapter
- 1 Tiger tail bottom cable guide

2 Manuals – operation and maintenance, DVD format

2 Spare parts catalogs, DVD format

1 Maintenance tool kit

1 Delivery of system

1 Day of training

2 Days of training, software

1 One year warranty, TV system

DETAILED SPECIFICATIONS**System Control Unit ("SCU")/Monitor Assembly**

A combination SCU/monitor for the system is provided in a fitted, damage-resistant Hardigg-style ATA-rated shipping case with six flush-mounted quick connect strap latches and carrying handles. The case has interior compartments which support the equipment in shipment. The case is constructed of a polypropylene material to prevent damage when transporting. Transportation case does not exceed 23"W x 21"H x 20"D. Total weight does not exceed 77 lbs.

The combination SCU will operate on a 120V AC, 60 Hz power source. The camera power supply is a solid state power source. The power supply will operate all Aries multi-conductor cameras on cable lengths up to 1000 feet or push cameras up to 400'. The lighting for the camera is supplied through an isolated power supply, which has separate controls. The SCU will power all Aries light styles for inspecting lines 3" thru 60" diameter. A light intensity control knob is located on the front panel of the unit.

The System Control Unit (SCU) has the following built-in features:

- Non-glare 9" color TV monitor, with 3" internal speaker and controls
- Video recorder Use/By-pass Switch
- Microphone jack
- Set of video recorder audio and video jacks
- Camera power selector switch, micro/mainline
- Light power selector switch, micro/mainline
- 5-Position lighthouse selector switch
- Lighthouse bulb protection system with an auto reset circuit breaker and trip indicator
- Lighthouse intensity control knob
- AC On/Off power switch with indicator light
- Set of individual circuit breakers for AC power input/lighthouse power output/camera power output
- Multi-function system diagnostic test meter with concurrent volt and amp LED readout
- Connection for Pan & Tilt handheld controller (when provided)
- Storage compartment mounted in the protective cover
- Monitor sun shield
- 120V AC power input plug with cord, GFI protected
- 120V AC duplex GFI-protected outlet
- Military connector for SCU to reel interconnect cable
- Connection for auxiliary lightbox (when provided)
- Expansion slot and keyboard tray position for factory-installed data display options

Color Monitor

The color monitor is housed in the Camera Control Unit. The monitor has a minimum 9" diagonal picture tube and operates on standard NTSC color. The monitor operates off the 110V AC provided by the camera control system.

The unit has a built-in microphone and 3" round speaker that can be used for verbal recording and play-back of survey information as part of video recording. The monitor and speaker will be able to be used to either view camera in operation or review play-back of pre-recorded tapes.



ARIES VL5000 sewer line video data display input, logging, and report system

The VL5000 data display module and report writer system provides pipeline condition recording and report writing functions.

The system places defect condition information along with distance of the camera in the pipe on the monitor screen, permanently on the video tape and into an on-board computer memory for report writing at the end of each run. The camera location in the line is continuously electronically fed to the VL5000 system from the cable footage input encoder mounted on the TV cable footage and level wind head assembly.

VL5000 data display system is all solid state micro processor electronics with current state-of-the-art computer memory with data processing capability. The unit is built into the system control unit. The faceplate has an industrial finish and permanent labels designating control functions and switches.

A full size complete "QWERTY" keyboard for data input is provided.

Features

- Menu-driven system, providing on-screen operator instructions
- 52 pipeline, service connection, and defect/observation codes are available
- Codes can be changed by user as needed
- Footage display is an LED read-out as well as on the TV monitor
- Footage display has non-volatile memory back-up (no battery required)
- Internal clock and calendar that can be displayed with the footage information
- Ability to store, edit and (optionally) print out operational report of inspection data
- Footage is automatically captured when observation data is added to the report list
- Video character brightness can be changed and accented with background
- VL5000 footage function (encoder signal counter and display) will continue to function even with loss of main power or video signal
- Footage display can be positioned anywhere on TV monitor screen
- Defect cursor arrow is provided
- Access to a blank screen for user-definable alphanumeric information is provided
- Encoder calibration factor can be changed to correct footage variance to actual (due to pulley wear) or to show footage in metric units
- Select footage count direction; to or away from unit
- Footage preset in units and tenths allows the operator to input footage from manhole center to starting point of video picture for accurate image position measurement
- Simple push button or joystick operation and control of all functions
- 120V AC operation
- Information that can be displayed with footage:
 - Time and date
 - Pull direction
 - Three lines of user-entered text
- Low power consumption
- VL5000 can be used without keyboard and printer. These can be supplied as upgrades to the basic VL5000 unit
- Video signal is by-passed when VL5000 is not powered.
- Power requirements: 200 watts maximum, 120V (+/- 20%), 50/60 Hz

Components

- VL5000 data display module for installation in standard SCU electronic console
- Interconnect cable to interface with any standard 10ppr (pulse per revolution) magnetic footage encoder
- Data input QWERTY keyboard

Video Capture Device

A portable video capture device is supplied with the system. The input to the unit is through a set of A/V cables from the camera system. The output is through a SD card, and a USB 2.0 port adapter is provided to download files to any PC. Video is recorded to MPEG4 format. The unit is powered by an internal rechargeable battery. The unit also has controls for review of the video on the system display.

Laptop Computer System

The software will run on a laptop computer. The laptop system includes:

- Intel processor
- 14" LCD display or larger
- Full sized keyboard
- Touchpad pointing device with scrolling function
- 8X DVD±R/W, 4X+DL optical media drive
- 250 GB SATA hard drive
- 4 GB RAM
- AC adapter
- Rechargeable smart lithium-ion battery pack
- LAN connection with 802.11a/b/g wireless transmitter

Pathfinder Reel and Cable**Dimensions**

Reel = 14" W x 21" D x 21" H

Cable = .285" in diameter

Features

Footage counter – front panel mounted with feed for external footage counter overlays

Electronic free-wheel clutch – push button operated with manual override

Hand crank – manual operation using a hand crank in the event of power failure

True Pulse Width Modulation (PWM) motor controller – controlled power for camera and tractor retrieval

Dolly frame for portable applications

Telescoping swivel cable guide

Reel

Reel drive – chain/sprocket through an electronic clutch

Reel frame – high strength aluminum tubing

Weight – 110 pounds with 1000' of cable

Level wind – aluminum screw-type for even placement during cable retrieval with manual override

Footage head – low friction with electronic encoder for high level of measurement accuracy



Cable strength – 1200 pound break strength due to Kevlar-braided internal member
Connector – resin-free and tapered

Pathfinder Zoom Camera

The pan and tilt camera is specifically designed to provide an optimum view of sewer pipe walls and lateral entrances through the use of a low light sensitive camera, movable camera head and directional solid state lighting. The unit produces a color video signal and is designed for operation through over 1,000' of multi-conductor cable in sanitary and storm sewers. Chassis construction is 100% solid state circuitry designed to withstand shocks and vibration normally sustained while being pulled through a pipe. The image pick-up device is a low light sensitive 0.14 Lux solid state camera incorporating the latest high-resolution closed circuit television technology. Operating climatic ranges of the camera are 0°C to 50°C, and up to 100% relative humidity.

The camera provides 360° of continuous axial rotation viewing with camera module rotation to view all sewer wall surfaces and lateral connections. The rotating camera and light head configuration provides 270° of pan and tilt angle measuring centerline to centerline. With the 75° lens viewing angle, this yields a total pan and tilt viewing area in excess of 345°. This configuration provides a reverse angle viewing capability for incoming lateral inspection when camera is moving downstream away from lateral connections. The camera design provides over 90% spherical viewing of the pipe or chamber being inspected.

The camera provides greater than 480 TV lines of horizontal resolution. The image pick-up device contains in excess of 379,000 pixels (768h x 494v). The camera develops a true color and transmits a sharp image picture on video bandwidths only. Full color video bandwidths are provided with no sacrifice of low frequency response. There is no visible streaking of the low frequency test bars when viewing a standard EIA Test Chart. The camera is equipped with an electronic controlled automatic iris for an acceptable picture between 0.1 and 10,000 Lux.

The camera contains Fast-Check pressure sensor circuitry to monitor the internal pressure of the camera and an external red LED to alert the operator in the event of pressure loss at all times. Positive internal pressure is the most effective way to prevent water entry to a camera and the resultant damage that occurs.

The camera can be connected and operate directly from the TV Cable to operate as a skid camera or for system troubleshooting.

Mechanical Features

360° camera continuous head rotation
345° pan and tilt viewing angle
Camera pressurized with dry nitrogen
360° slip rings, military-rated gold contacts
Camera body extends to camera front to withstand severe shock
Scratchproof sapphire color camera window
Brush DC drive motors with mechanical clutches on all motor motions
Redundant pressure seals at each external moving joint for long seal life
Military glass to metal hermetic seals (secondary) at all LED / Laser windows
Ball bearings used on all moving external parts
Length = 8.0"
Head Diameter = 3.25"

Electronic Features

DC/DC converter power supply input (20-60VDC), input polarity protected
Internal light head regulator
Dielectric tested to insure operator safety
Home view feature to return camera to upright and forward viewing automatically, with forks above and below the camera head. Both home motions operate simultaneously.
Long life, shock resistant, warm white LED internal light ring, moves with color camera
Camera operating software contained in EEPROM, which allows future performance improvements to be programmed into camera without any hardware changes
Gold military-rated camera connector
Internal pressure sensor and external LED indicator (Fast-Check)
On-screen status indicators: white balance, zoom, focus, Starlite
"No Blur" variable rotate and pan motion speed based on zoom ratio
Simultaneous motion operations for quick location

Color Camera Module - Technical Specifications

1/3" CCD
768h x 494v Picture Elements (379,392 total)
480h TV lines resolution
Image scanning 525 lines at 60 Hz (NTSC), 2:1 interlaced
Low light 0.14 Lux color chip camera
Precise image geometry, no image burn-in
Excellent color rendition
Image pick up device (CCD) has a lower random noise feature than other devices
1/2" to ∞ remote controlled focus

The design of the camera head allows it to view 360° around the entire barrel of the pipe. The pan and tilt feature permits up to 70° of rear viewing, thus permitting examination of a lateral while moving the camera either up or down stream.

The camera is pressurized with dry nitrogen to prevent external moisture from entering. An external LED indicator advises when pressure is at the proper level or if it is low.

The camera contains a time clock that measures and records the total operating time of the camera for maintenance purposes. Camera serial number, software revision, etc., can be determined.

Camera Controller

The pan and tilt angle and rotational motion are remotely controlled from the desktop controller. The controller is equipped with a joystick to pan, tilt and rotate the view providing complete, undistorted pipe barrel and lateral connection viewing. The controller is equipped with remote focus, remote iris, and zoom in/out controls. The controller is designed for quick hook-up to the power control unit when the pan and tilt camera is being used. It is compact and easily stored while not in use.

Pan & Tilt Zoom Lens

The camera is equipped with a 4.2~42mm optical zoom lens for a 10x optical zoom and a 4x digital zoom.

High Intensity Directional LED Lighting System

A high intensity lighting system is furnished to provide the proper illumination to inspect down the pipe, along the pipe crown, invert, sidewalls and laterals while using the camera. The lighting system uses a 10,000 hour life Warm White LED lighting system. The lighting system is designed for inspecting connections, pipe walls and joints in pipe sizes from 5"-36" in diameter.

Solid State Camera Control Circuitry

The color camera is equipped with the necessary circuitry to allow for the remote adjustment of the optical focus from the controller unit at the viewing station. The camera is calibrated with both color bench test and picture analysis equipment at the factory.

Camera Storage and Transportation Case

A damage resistant case is provided for the camera and light head while it is in storage or during transport, including shipping on commercial carriers. The interior of the case contains a foam saddle and a lid installed yoke to firmly hold the camera and protect it from damage. The case is equipped with metal closing latches.

Pathfinder Tractor

The Aries Pathfinder self-propelled wheeled steerable camera transporter assembly including specified camera facilitates the remote inspection of lines ranging from relined 6" to 24" including offsets and protrusions.

The transporter incorporates a 6-wheel drive system designed to match the contour of the pipe regardless of pipe size. The drive motors are specifically designed to meet the power and torque requirements of the system, regardless of size of pipe being inspected.

The transporter is capable of operating in power forward, power reverse, steer-left, steer-right, and free wheel. The transporter may be retrieved in the free wheel mode by the video cable reel. This will reduce the normal wear on the drive motor and drive by fifty percent (50%).

Dimensions

Overall length with camera attached = 16" (with rear connector)

Overall width with 3 $\frac{3}{8}$ " tires = 4.5"

Overall height = 3 $\frac{3}{8}$ "

Overall weight = 24.5 lbs. with camera and swivel connector

Mechanical Features

The Aries Pathfinder tractor is operable in 6" lines that have been relined, producing an internal diameter of less than 5.5". The tractor includes (2) internal brushless motors, each with electronic clutch, that allow forward and reverse drive, as well as left/right and freewheel functions. In the event of a rollover in the pipe, the tractor remains operable. The rear connector is designed to pivot up and down to aid in unit removal from a culvert. The wheels are changeable with a single nut, providing a quicker changeover.

The tractor has a manual lift to raise the camera to the center of the pipe and out of the pipe flow. The lift is capable of raising the camera 4.3" from its down position. The lift still allows inspection of true 6" pipelines when installed.

The tractor has a standard integrated rear viewing color camera with LED Lighting to eliminate operating blindly when in reverse or when pulling the tractor back with the reel.



The tractor contains Fast-Check pressure sensor circuitry to monitor the internal pressure of the tractor and an external red LED to alert the operator in the event of pressure loss at all times. Positive internal pressure is the most effective way to prevent water entry to a tractor and the resultant damage that occurs.

Tractor Controller

The controller is equipped with a joystick to control forward, reverse, right and left pivot motions remotely from the operator's station. The controller also has pushbuttons to control the clutch (On/Off), aux lighting (On/Off), reverse view camera (On/Off) and beacon transmitter (On/Off).

The tractor contains an internal 512Hz beacon transmitter with operator On/Off Control.

Cable manhole guide system

Manhole Top Roller

A top roller assembly to guide the cable or hose over the lip of and into the manhole is provided. This assembly is made to operate in a 18" to 30" manhole opening.

Insertion / Extraction Pole Assembly

An extendable pole assembly with a hook and adapter for the tractor for inserting or removing the camera and tractor are provided.

Tiger Tail

A down-hole protective sleeve for the cable with a 20 foot lanyard and snap swivel is provided.

Training, Customer's Facility

One day of operations and maintenance training is included. Aries will fully instruct and test the customer's employees in the operation of the equipment furnished after delivery. The instruction and testing is conducted by a field service technician and includes component familiarization, theory of operation, field procedures, techniques of use, troubleshooting, maintenance recording, and logging of sewer conditions and safety procedures.

An additional two day session will be included. This training session shall be specialized for the software installation included with this system. The session will be led by an software-authorized trainer.

Maintenance Tool Kit

16" plastic toolbox

Mechanical

(5) combination wrenches, 3/8, 7/16, 1/2, 9/16, 5/8

(7) hex wrenches, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, and 3/16, with pouch

10" adjustable wrench

7" diagonal pliers

7" needle nose pliers

12" groove joint pliers

10" locking pliers (vise-grip)

5/16 nutdriver

Offset screwdriver

(3) slotted screwdrivers, 8mm x 5", 6mm x 4", 3mm x 3"

(3) Phillips screwdrivers, #1 x 3", #2 x 4", #3 x 5"

Electrical

Soldering iron

Solder, 60/40 resin core

Multi-meter with AC/DC voltage, resistance, and continuity

8" wire cutter / stripper / crimper

Utility knife

Consumables

10yd roll UL electrical tape

Connector lubricant, 1oz

(20) tie wraps, 4.5"

(10) tie wraps, 8"

(6) tie wraps, 14"



Sewer Camera System

This sewer television system is delivered complete, ready for operation. The system includes a pan & tilt camera and transporter with light head capacity from relined 6" to 24" lines. Components can be used with the base unit including a small diameter color camera for pull, push or tractor applications.

COMPONENT LIST

1 System Control Unit ("SCU") assembly mounted in a Hardigg-style, ATA airline-rated shipping case. Major built-in components are:

- 1 Non-glare 9" color TV monitor / VCR ombo, with 3" internal speaker and controls
- 1 Monitor sun shield
- 1 Video recorder bypass switch
- 1 Set of video recorder audio and video jacks
- 1 Microphone jack
- 1 Audio recording microphone
- 1 Camera and tractor portable desktop controller and cable
- 1 Camera power selector switch, micro/mainline
- 1 Light power selector switch, micro/mainline
- 1 5-position lighthouse selector switch
- 1 Lighthouse protection system with an auto reset circuit breaker and trip indicator light
- 1 Lighthouse intensity control knob
- 1 AC power switch with indicator light
- 1 Set of individual circuit breakers for AC power input/lighthouse power output/camera power output
- 1 120V AC power input GFI protected plug with cord
- 1 120V AC duplex GFI protected outlet
- 1 Military connector for SCU to reel interconnect cable (prewired for push reel, pull reel, tractor and on-screen footage features)
- 1 Multi-function system diagnostic test meter with concurrent volt and amp LED readout
- 1 Storage compartment mounted in shipping case protective cover
- 1 Internal video overlay character generator
- 1 Parallel port for laptop computer hookup

1 Portable system controller, matched to system equipment

1 Portable video capture and review system, including:

- 1 Capture unit to compress video in MPEG4 format
- 1 16GB SD card with USB adapter
- 1 Set of interconnect cabling



1 Laptop computer, with minimum features including:

- Intel processor
- 250 GB SATA Hard Drive
- 4 GB RAM
- 8X DVD±R/W, 4X+DL optical media drive
- Smart Li-ION battery
- Integrated 10/100/1000Mbps Ethernet LAN & wireless 802.11a/b/g/n wireless module
- Full sized keyboard and touch pad pointing device

- 1 Windows 7 operating system software

1 POSM Pro software and license

- 1 Video capture hardware kit
- 1 Video overlay device

1 Portable TV cable reel assembly including:

- 1 Slip ring signal collector assembly, prewired for camera and tractor transporter
- 1 Cable reel drum with hand crank and brake mounted on wheeled frame with handle
- 1 Motor drive, 120VAC with variable speed drive and electric clutch
- 1 Footage head with mechanical counter, automatic level wind and footage encoder mechanism

1 Combination Video Transmission/Tow Cable Single-Conductor, .270" diameter, 5,600 lb. Rating, 1,000' single conductor, to include:

- 1 NRTL-approved cable terminal connector
- 1 Tow/tag line bridle set, single conductor cable
- 1 Cable terminal repair kit

1 Aries SC1305 "Illumi-Zoom" single conductor, pan and tilt radial view, zoom color sewer TV camera consisting of:

- 1 Directional Camera Light System for 6" to 36" Pipes, LED
- 1 Camera Storage and Transport Case
- 1 Spare Parts Kit
- Camera features include:
 - 360° axial rotation
 - 230° average pan and tilt rotation
 - 40X zoom (10X optical & 4X digital)
 - Auto or remote adjustable focus
 - Auto or remote adjustable iris
 - Automatic home feature with forks at top and bottom of camera head
 - White balance selection
 - NTSC color imaging module
 - SMARTEK internal diagnostic system
 - 0.1 Lux low-light STARLITE mode



- 1 Aries TR3115 "Mini-Badger" single conductor, self-propelled wheel drive transporter for 6" to 36" lines, including:**
 - 1 Tractor assembly with continuous duty drive motor
 - 1 Set each of 3", 4" and 5" rubber tires for 6" to 30" lines
 - 1 Set transmission couplings and weighted adjustment bars for operation in 8" to 30" sewer lines
 - 1 Plywood storage and shipping box with removable cover
 - 1 Set maintenance parts
 - 1 Large diameter kit with transmission gearing side rails and 8" diameter rubber tires for operation up to 36" lines
 - 2 3" carbide impregnated high traction wheels
 - 2 4" carbide impregnated high traction wheels
 - 2 5" carbide impregnated high traction wheels
- 1 Detachable 512 Hz beacon for accurate camera location in both metallic and non-metallic pipes**
- 1 Cable manhole guide system including:**
 - 1 Manhole top roller assembly
 - 1 Insertion and extractor pole assembly and tractor adapter
 - 1 Tiger tail bottom cable guide
- 2 Manuals – operation and maintenance, DVD format**
- 2 Spare parts catalogs, DVD format**
- 1 Maintenance tool kit**
- 1 Delivery of system**
- 1 Day of training**
- 2 Days of training, software**
- 1 One year warranty, TV system**

DETAILED SPECIFICATIONS**System Control Unit ("SCU")/Monitor Assembly**

A combination SCU/monitor for the system is provided in a fitted, damage-resistant Hardigg-style ATA-rated shipping case with six flush-mounted quick connect strap latches and carrying handles. The case has interior compartments which support the equipment in shipment. The case is constructed of a polypropylene material to prevent damage when transporting. Transportation case does not exceed 23"W x 21"H x 20"D. Total weight does not exceed 77 lbs.

The combination SCU will operate on a 120V AC, 60 Hz power source. The camera power supply is a solid state power source. The power supply will operate all Aries multi-conductor cameras on cable lengths up to 1000 feet or push cameras up to 400'. The lighting for the camera is supplied through an isolated power supply, which has separate controls. The SCU will power all Aries light styles for inspecting lines 3" thru 60" diameter. A light intensity control knob is located on the front panel of the unit.

The System Control Unit (SCU) has the following built-in features:

- Non-glare 9" color TV monitor, with 3" internal speaker and controls
- Video recorder Use/By-pass Switch
- Microphone jack
- Set of video recorder audio and video jacks
- Camera power selector switch, micro/mainline
- Light power selector switch, micro/mainline
- 5-Position lighthouse selector switch
- Lighthouse bulb protection system with an auto reset circuit breaker and trip indicator
- Lighthouse intensity control knob
- AC On/Off power switch with indicator light
- Set of individual circuit breakers for AC power input/lighthouse power output/camera power output
- Multi-function system diagnostic test meter with concurrent volt and amp LED readout
- Connection for Pan & Tilt handheld controller (when provided)
- Storage compartment mounted in the protective cover
- Monitor sun shield
- 120V AC power input plug with cord, GFI protected
- 120V AC duplex GFI-protected outlet
- Military connector for SCU to reel interconnect cable
- Connection for auxiliary lightbox (when provided)
- Expansion slot and keyboard tray position for factory-installed data display options

Color Monitor

The color monitor is housed in the Camera Control Unit. The monitor has a minimum 9" diagonal picture tube and operates on standard NTSC color. The monitor operates off the 110V AC provided by the camera control system.

The unit has a built-in microphone and 3" round speaker that can be used for verbal recording and play-back of survey information as part of video recording. The monitor and speaker will be able to be used to either view camera in operation or review play-back of pre-recorded tapes.

Portable Control Unit

The controller is a single portable control unit, which has a quick-connect cable hookup to the camera control unit. Microprocessor controlled signaling allows for more than one function to operate simultaneously.

The following list describes each of the controller's camera functions:

- ☐ Lighthouse Intensity (High-Medium-Low)
- ☐ Focus (In-Out)
- ☐ Iris (Open-Close)
- ☐ Zoom (In-Out)
- ☐ Pan (Left-Right)
- ☐ Rotate (CW-CCW)
- ☐ Test (NSTC Color Bar-SMARTEK Diagnostics)
- ☐ Inclinator Signal (On-Off)
- ☐ Home (pushbutton)

Automatic focus and iris occurs when the camera is "homed". Focus and iris adjustments override the automatic function and remain manual until the camera is homed again.

The following list describes each of the controller's tractor functions:

- ☐ Speed (High-Medium-Low)
- ☐ Direction (Forward-Stop-Reverse)

All switches are rocker-style momentary contact with the exception of the tractor controls, light intensity, pan, and rotate. These are rocker-style, but not momentary contact.

Video Capture Device

A portable video capture device is supplied with the system. The input to the unit is through a set of A/V cables from the camera system. The output is through a SD card, and a USB 2.0 port adapter is provided to download files to any PC. Video is recorded to MPEG4 format. The unit is powered by an internal rechargeable battery. The unit also has controls for review of the video on the system display.

Laptop Computer System

The software will run on a laptop computer. The laptop system includes:

- Intel processor
- 14" LCD display or larger
- Full sized keyboard
- Touchpad pointing device with scrolling function
- 8X DVD±R/W, 4X+DL optical media drive
- 250 GB SATA hard drive
- 4 GB RAM
- AC adapter
- Rechargeable smart lithium-ion battery pack
- LAN connection with 802.11 a/b/g wireless transmitter

Portable TV Cable Reel Assembly

1000 feet of 1/4" double armored steel single conductor video cable is provided on a wheeled cart. The reel cart frame has two handles; one on each end so that two people can easily lift the reel in and out of a truck. The cable is terminated on the reel with a slip ring signal collector assembly. This assembly is maintenance-free and provides continuous video signal as cable is drawn off or returned. The slip ring housing contains a connector for connecting to power control unit. The camera end of cable is terminated with a 3-pin connector. A strain relief is installed for connection to the mainline camera skid bridle.

The cable reel has an electric motor. The motor is controlled by a variable speed motor controller mounted on the reel. The motor drive is connected to the reel with a chain and sprocket drive train. The motor has an electric clutch, which can engage or disengage the drive chain. The motor has an on/off power switch and protective, resettable breaker or fuse. The reel drive system is powered by 120V AC.

A mechanical footage head is provided which indicates cable travel. An automatic level wind assembly is provided on the reel to evenly distribute cable over reel drum. The reel assembly, complete with cable, falls within measurements of 24 inches wide by 30 inches deep by 40 inches high, weighs 228 lbs., and easily passes through a nominal 30" doorway.

Combination Video Transmission/Tow Cable, Single-Conductor

A combined video and towing cable is furnished in continuous length. The cable consists of a shielded coaxial center core wrapped with Mylar insulation. A double wrap of steel wires encircles the center core to provide the cable with the required towing tensile strength. The complete cable is torque balanced to prevent unraveling or stretching of the steel wire wraps. The cable has a minimum break strength of 5,600 lbs., and does not exceed more than .270" in diameter. It also withstands external pressures of up to 400 PSI.

Aries "Illumi-Zoom" Single Conductor Color Pan and Tilt Camera

The pan and tilt camera is specifically designed to provide an optimum view of sewer pipe walls and lateral entrances through the use of a low light sensitive camera, movable camera head and directional lighting. The unit shall produce a color video signal and is designed for operation through up to 4,000' of single-conductor cable in sanitary and storm sewers. Chassis construction is 100% solid-state circuitry designed to withstand shocks and vibration normally sustained while being pulled through a pipe. The image pick-up device is a low light sensitive (2 Lux standard mode, 0.1 Lux STARLITE mode) solid-state camera incorporating the latest high-resolution closed circuit television technology. Operating climatic ranges of the camera are 0°C to 50°C, and up to 100% relative humidity.

The camera provides 360° of axial rotation with camera module rotation to view all sewer wall surfaces and lateral connections. The rotating camera and light head configuration provides 250° of pan and tilt angle with the LED lighting and 210° with the high performance lighthouse. The field of view when viewed on a standard monitor is 103° x 97°. This configuration provides a reverse angle viewing capability for incoming lateral inspection when camera is moving downstream away from lateral connections.

The camera provides nominal 500 TV lines of horizontal resolution. The image pick-up device contains in excess of 379,000 pixels (768h x 494v). The camera develops a true color and transmits a sharp image picture on video bandwidths only. Full color video bandwidths are



provided with no sacrifice of low frequency response. There is no visible streaking of the low frequency test bars when viewing a standard EIA Test Chart. The camera is equipped with an automatic iris with remote override, operator selectable to full manual control if desired to control the illumination range for an acceptable picture between 0.1 and 10,000 Lux.

Operating Conditions

Line Sizes: 6" to 120" diameter
Temperature: 0°C to 50°C
Moisture: Up to 100% R.H.

Mechanical Features

360° camera head rotation
Pan and tilt viewing angle sufficient for 135° lateral entrances
Camera pressurized with dry nitrogen to withstand 50 psi
Camera forks inset into body pockets to withstand severe shock
Forks extend beyond the head to protect from front impacts
Scratchproof sapphire color camera window
DC drive motors with planetary gearboxes
All motor motions clutched to prevent damage to drive system by overloads or impacts
Dirt seals and pressure seals at all external moving joints for longer seal life
Ball bearings used on all moving external parts
Length = 19.875"
Body Diameter = 3" with 2.5" flats
Head Diameter = 2.7" without attached lighthouse
Fits standard 3" camera skid yoke or tractor camera carriage

Electronic Features

DC/DC converter power supply input (18-60V)
Internal lighthouse regulator
Dielectric tested to ensure operator safety
Home view feature to return camera to upright and forward viewing automatically, with forks at the top and bottom of the camera head
Camera operating software contained in EEPROM, which allows future performance improvements to be programmed into camera without any hardware changes
Sealed cord connector
Connects to standard single-conductor systems with available adapter cable

Frequency Shift Keying (FSK) communication is used as a control technology permitting multiple concurrent camera and tractor functions simultaneously, i.e. focus/iris, rotate and all tractor functions.

The camera's components, electronic modules, and or circuitry are of industrial instrument-grade quality only. Chassis construction is 100% solid-state circuitry, designed to withstand shocks and vibration normally sustained while being pulled or transported through a pipe to a distance of up to 4000 feet, using double armored steel coax cable.

Color Camera Module - Technical Specifications

1/4" super HAD CCD
768h x 494v; 379,392 total pixels
500h TV lines resolution nominal



Image scanning 525 lines at 60 Hz (NTSC), 2:1 interlaced
Low light 0.1 Lux color chip camera with 10 bit DSP, 3rd generation
Maximum zoom ratio 40x (10x Optical / 4x Digital)
Large pipe wall and connection inspections up to 120" in diameter
Precise image geometry, no image burn-in
Excellent color rendition
Image pick up device (CCD) has a lower random noise feature than other devices
4.2 ~ 42 mm, f1.8, zoom lens
½" to ∞ automatic or remote controlled focus with zoom

"SMARTEK" On-Screen Diagnostics

The on-screen camera diagnostics package allows the operator to be constantly aware of the operating parameters within the camera. It monitors and displays on the screen upon command:

- Internal camera pressure (psi)
- Internal camera humidity (%RH)
- Camera regulated voltage (VDC)
- Camera head temperature (°F)
- Lighthouse supply current (A)

The camera contains a time clock that measures and records the total operating time of the camera for maintenance purposes. Camera serial number, software revision, etc., can be displayed. The camera diagnostics package includes a color bar generator. Upon command the camera generates a standard EIA color bar signal. This signal is used to properly adjust the monitor color controls and troubleshoot the system.

Zoom Lens

The camera is equipped with a zoom lens with 10x optical zoom and a 4x digital zoom. The supplied camera automatic controlled focus and iris with remote controlled override of these functions. The focus and iris assembly is attached and mounted in a waterproof, housing and will view the pipe while being televised through an optical quality sapphire lens window with an overall diameter not exceeding 1.5".

NTSC Color Bar Generator

The camera is equipped with a NTSC color bar test generator to provide a standard of system performance. It is remote controlled to turn on and off from the operator's control console. The color hue, color saturation, and video signal level is preset so that when the generator is commanded to transmit its test signal, the overall system performance may be evaluated. This aids in troubleshooting and diagnostic testing. The signal level is pre-set to deliver 140 IRE units composite and includes 7 color bars - black, white, yellow, cyan, magenta, red, and blue.

Protective Housing

The camera housing is waterproof and sealed to withstand a pressure of 50psi. It is internally charged to a pressure of 15psi using dry nitrogen through a valve stem mounted on the rear of the camera. The rear of the housing has a recessed bell protecting the indexed cable connector. The camera housing is manufactured from corrosion resistant, heavy duty, thick walled, stainless steel, and does not exceed 3" in diameter. Its size permits it to be utilized with any existing TV inspection skids, transporters, or floatation units. A single water blocked, rubber molded, adjustable orientation, 3-pin polarized male camera connector provides the necessary connection to the single conductor TV cable.

Lighting

The lighting system is external to the camera head for greatest illumination efficiency, lowest heat transfer to the camera imager device, ease of interchangeability between lightheads, and versatility in accommodating a wide range of sizes, color and pipe conditions.

Externally mounted light head(s) that attach to the front of the camera are supplied with the camera.

One (1) low voltage LED lighthead no larger than 2.95" OD is provided with borosilicate glass protective windows. A stainless steel protective wear ring encompasses the exposed edge protecting the lighthead in 6" lines where it may come in contact with sewer pipe walls while being transported through the sewer line.

Each of the above referenced light heads has three gold plated contact pins to supply regulated low voltage light head power. Each light head attaches to the front external circumference of the camera lens. Each gold plated contact pin has a silicone "wiper" o-ring to create a water block for a maximum pressure of 75psi.

Test Cable

A 3-pin test cable and simulator is provided for camera testing as an aid to help isolate camera, cable, or cable connector problems that might occur if the cable becomes damaged due to heavy usage. The test cable, with its cable simulator unit, permits hooking the camera directly to the camera control unit - bypassing the normal cable, reel, slip rings, and connectors.

Camera Storage and Transportation Case

A damage resistant case is provided for the camera and light head while it is in storage or during transport, including shipping on commercial carriers. The interior of the case contains a foam saddle and a lid installed yoke to firmly hold the camera and protect it from damage. The case is equipped with metal closing latches.

Mini-Badger Single Conductor Camera Transporter (6" to 36" lines)

The Aries self-propelled 6-wheeled camera transporter assembly including specified camera will facilitate the remote inspection of lines ranging from 6" to 36" including offsets and protrusions.

Adjustment bars are supplied for operation in pipes ranging from 8" through 30" diameter. These adjustment bars position the camera and lighting system to the centerline of the pipe by widening the tracks and raising the camera simultaneously. The bars also add weight to the transporter to increase its tractive effort. The transporter weights (not including camera) increase for each pipe size according to the chart at right.

The transporter incorporates a 6-wheel drive system designed to match the contour of the pipe regardless of pipe size. The drive motor is specifically designed to meet the power requirements of the system, regardless of size of pipe being inspected.

Line Size (in. dia.)	Tractor (lbs.)	w/ Camera (lbs.)
6	30.1	41.1
8	31.7	42.7
10	32.5	43.5
12	35.2	46.2
15	39.2	50.2
18	45.6	56.6
21	48.2	59.2
24 & up	50.8	61.8

The transporter is capable of operating in power forward, power reverse, and neutral. The transporter may be retrieved in the neutral mode by the video cable reel. This reduces the normal wear on the motor and drivetrain by 50%.

The stand-alone length of the transporter is 21.1". The combined length of the transporter and pan & tilt camera assembly does not exceed 27.5" with the SC1300 camera in the home position. This allows the inspection and traversing of 6" diameter offset, meandering, or relined pipes. It also facilitates entry into short inverts. Sets of 3", 4" and 5" rubber tires are provided for various pipe type surfaces.

Large Line Kit

A large line conversion kit will also be supplied. The field-interchangeable kit consists of two side rails that utilize the (6) wheel hubs and a gear train to power (4) 8" diameter rubber tires. This makes the transporter operational in sewer lines up to 36".

Cable manhole guide system

Manhole Top Roller

A top roller assembly to guide the cable or hose over the lip of and into the manhole is provided. This assembly is made to operate in a 18" to 30" manhole opening.

Insertion / Extraction Pole Assembly

An extendable pole assembly with a hook and adapter for the tractor for inserting or removing the camera and tractor are provided.

Tiger Tail

A down-hole protective sleeve for the cable with a 20 foot lanyard and snap swivel is provided.

Training, Customer's Facility

One day of operations and maintenance training is included. Aries will fully instruct and test the customer's employees in the operation of the equipment furnished after delivery. The instruction and testing is conducted by a field service technician and includes component familiarization, theory of operation, field procedures, techniques of use, troubleshooting, maintenance recording, and logging of sewer conditions and safety procedures.

An additional two day session will be included. This training session shall be specialized for the software installation included with this system. The session will be led by an software-authorized trainer.

Maintenance Tool Kit

16" plastic toolbox

Mechanical

(5) combination wrenches, 3/8, 7/16, 1/2, 9/16, 5/8

(7) hex wrenches, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, and 3/16, with pouch

10" adjustable wrench

7" diagonal pliers

7" needle nose pliers

12" groove joint pliers

10" locking pliers (vise-grip)

5/16 nutdriver

Offset screwdriver



- (3) slotted screwdrivers, 8mm x 5", 6mm x 4", 3mm x 3"
- (3) Phillips screwdrivers, #1 x 3", #2 x 4", #3 x 5"

Electrical

- Soldering iron
- Solder, 60/40 resin core
- Multi-meter with AC/DC voltage, resistance, and continuity
- 8" wire cutter / stripper / crimper
- Utility knife

Consumables

- 10yd roll UL electrical tape
- Connector lubricant, 1oz
- (20) tie wraps, 4.5"
- (10) tie wraps, 8"
- (6) tie wraps, 14"

ONE YEAR LIMITED WARRANTY POLICY

Aries Industries, Inc. (Aries) warrants all new items of our manufacture for defects in materials and/or workmanship. The warranty period shall begin from the date of receipt by the Customer.

This policy is limited to items manufactured by Aries.

Aries shall have, at their option, the right to repair or to replace any defective part or component at their service facility(s), or to ship the Customer a replacement component or part.

Not covered by this policy are expendable or wear-out items such as some light bulbs, drive belts, cables, batteries, and connectors.

Generators, monitors, VCRs, air conditioners, and all other items not manufactured by Aries shall be covered by each manufacturer's warranty.

No warranty shall be applicable to malfunctions due to damage, neglect, wear, misuse, using unauthorized parts, or improper handling or repairs to any part of the equipment. Improper repairs are deemed to be repairs made by persons other than factory authorized personnel.

Any unauthorized repairs of any Aries manufactured equipment will invalidate the warranty.

The responsibility of Aries is set forth above.

Aries shall not be liable for any consequential or incidental damages to persons or property resulting from use of or any breach of warranty expressed or implied to this (these) products.